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REVIEW OF EPA'S PROPOSED REVISION TO THE OZONE NAAQS

HEARING

BEFORE THE

SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY

OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

July 11, 2007

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ONE HUNDRED TENTH CONGRESS
FIRST SESSION

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[1]Note: During the 110th Congress, Senator Craig Thomas, of Wyoming, passed away on June 4, 2007. Senator John Barrasso, of Wyoming, joined the committee on July 10, 2007.

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REVIEW OF EPW'S PROPOSED REVISION TO THE OZONE NAAQS

TUESDAY, JULY 11, 2007

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY
Washington, DC.

The subcommittee met, pursuant to notice, at 10 o'clock a.m. in room 406, Dirksen Senate Office Building, Hon. Thomas R. Carper (chairman of the committee) presiding.

Present: Senators Carper, Voinovich, Boxer, Inhofe

OPENING STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Senator CARPER. The hearing will come to order. Welcome, everyone.

Today's hearing, as we know, is on the EPA's recent proposal to tighten, the strengthen, I believe, the National Air Quality Standard for Ground Level Ozone. Our Senators will have, each of us will have 5 minutes for opening statements. Then I will recognize Administrator Johnson from EPA to offer his testimony to our Committee. We will subject him to two rounds of questions following his statement, and then we will ask our second panel to come forward and present their testimonies and we will query them as well.

I understand that we have a vote coming up at 11:30, and if we are smart, and can do our job well, we can conclude this hearing right in time to be able to get over and vote, to do justice here to this important subject and also to fulfill our responsibilities in the Senate chamber itself.

Let me begin with an opening statement, then I will defer to my friend and colleague, Senator Voinovich, and we will abide after that, Senator Boxer, Senator Inhofe and then by the early bird rule.

Since the Clean Air Act was first passed into law, we have made significant environmental progress in this Country. But our work is not over. In Delaware, our entire State exceeds EPA's health standards for ozone. And New Castle County, which is where I live, in northern Delaware, doesn't meet EPA standards for fine particulate matter. According to a recent survey, during each of the summer months when ozone pollution is at its worst in our part of the Country, over 10,000 adult Delawareans are unable to work or carry out daily activities for at least one or more days per year. And that is just in one small State, my home State. The dirty air

that millions of Americans are being forced to breathe is costing us dearly.

The National Association of Manufacturers released a publication in March that some of us may have seen. It is entitled Health Care Cost Crisis. The publication states that the rising cost of health coverage is one of the biggest challenges that manufacturers face today. I am sure that most of us would agree. In fact, I am going to ask unanimous consent to enter their statement into the record, without objection.

[The referenced material was not received at time of print.]

Senator CARPER. In terms of solutions, the first quick fix that the National Association of Manufacturers offers is the following: intensively managing chronic health care conditions, such as diabetes, hypertension, asthma, saying that we can generate substantial cost savings and increase productivity at the same time.

The health care costs of asthma are staggering. In Delaware each year, one out of three adults with asthma will visit the hospital one or more times. And one out of five adults with asthma reported one or more visits to an emergency room or an urgent care center because of their asthma during the course of the year. In a report titled The Burden of Asthma in Delaware, Delaware's Division of Public Health determined the total statewide charges for asthma treatment and medication could be as high as $25 million to $30 million a year. That is just in a small State with fewer than a million people. But in my State, that is real money.

When I was privileged to be Governor of Delaware, I discovered that the costs of breathing dirty air are a far heavier burden on our economy than the costs of air pollution controls. Setting air quality standards to protect our citizens from the physical and economic burdens of dirty air is an important step.

However, setting more stringent national standards must be coupled with a national strategy to achieve them. That is why I feel that the enactment of legislation that a number of my colleagues have joined me in introducing, the Clean Air Planning Act, or legislation similar to it, is so important. Some of you know, our bill will require significant reductions in sulfur dioxide, nitrogen oxide, mercury and CO_2 from the largest polluter in this Country, and that is our power plants. Specifically, our bill will greatly reduce ozone pollution. It requires that the emission of nitrogen oxide from power plants be cut from 5 million tons annually to about 1.7 million tons annually by 2015. With these reductions in 10 years only 11 areas in our Nation will then exceed EPA's health standards for ozone, only 11.

I might add that our proposal also calls for cuts in sulfur dioxide emissions by some 82 percent by 2015. As you know, sulfur dioxide pollution causes several chronic health problems. I won't elaborate, but we are familiar with many of them.

According to EPA, our proposal would cut the number of areas currently in non-attainment for particulate matter by over 70 percent by 2010. I commend you, Administrator Johnson, for realizing that more needs to be done to radically protect public health from ozone and for proposing to do something about it by strengthening the current standards. Let me implore you, though, to make sure

that your decision follows the scientific advice given to you by your staff and by the Clean Air Scientific Advisory Committee.

Last, let me encourage you to work with this Committee to develop a national strategy to achieve those standards. With that having been said, I will turn to my friend, Senator Voinovich, for his statement.

[The prepared statement of Senator Carper follows:]

STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Since the Clean Air Act was first passed into law we have made significant environmental progress. But our work is not over. In Delaware, the entire State exceeds EPA's health standards for ozone, and New Castle County doesn't meet EPA's standard for fine particulate matter. According to a recent survey[1], during each of the summer months when ozone pollution is at its worst over 10,000 adult Delawareans are unable to work or carry out daily activities for one or more days. And that's just in my small, home State. The dirty air millions of Americans are being forced to breathe is costing us dearly.

The National Association of Manufacturers released a publication in March titled Health Care Cost Crisis. The publication states "the rising cost of health coverage is one of the biggest challenges manufacturers face today." In terms of solutions, the first "quick fix" the NAM offers is the following: "Intensively managing chronic health care conditions (e.g. diabetes, hypertension, asthma) can generate substantial cost savings and increase productivity."

The health care costs of asthma are staggering. In Delaware, each year, about 32 percent of adults with asthma must visit the doctor one or more times. And 19 percent reported one or more visits to an emergency room or urgent care center because of asthma. In a report titled, The Burden of Asthma in Delaware, Delaware's Division of Public Health determined that total statewide charges for asthma treatment and medications could be as high as $25 to $30 million a year.

In my small State, that is real money. While I was Governor, I discovered that the costs of breathing dirty air are a far heavier burden on our economy than the costs of air pollution controls. Setting air quality standards to protect our citizens from the physical and economic burdens of dirty air is an important step.

However, setting more stringent national standards must be coupled with a national strategy to achieve them. That is why I feel my legislation, the Clean Air Planning Act, is so important. It will require significant reductions from the largest polluters in the country—power plants. Specifically, my bill will greatly reduce ozone pollution. It will cut nitrogen oxide from 5 million tons today to 1.7 million tons in 2015. With these reductions in 10 years only 11 areas in the Nation will exceed EPA's health standards for ozone.

My proposal will also cut sulfur dioxide emissions by 82 percent by 2015. Sulfur dioxide pollution causes several chronic health problems. According to EPA, my proposal would cut the number of areas currently in nonattainment for particulate matter by over 70 percent by 2010. I commend you, Administrator Johnson, for realizing that more needs to be done to adequately protect public health, and proposing to strengthen the current standard. I would implore you to make sure your decision follows the scientific advice given to you by your staff and by the Clean Air Science Advisory Committee. And last, I encourage you to work with this committee to develop the national strategies to achieve these standards.

OPENING STATEMENT OF HON. GEORGE VOINOVICH, U.S. SENATOR FROM THE STATE OF OHIO

Senator VOINOVICH. Thank you, Senator Carper. Thanks for holding this hearing today on the EPA's review of the National Ambient Air Quality Standards. I hope it will provide us with some real good debate as the agency determines whether to retain or amend the current standards.

Administrator Johnson, I appreciate your being here to share your thoughts on the agency's review. I appreciate all of the con-

[1](the Behavioral Risk Factor Survey is an annual survey of Delaware's adult population about behaviors which affect risk of disease and disability).

versations that we have had over the last number of months. I look forward to your comments. I would also like to thank the other panelists for being here today to share their perspective on this important rulemaking. EPA's review of the ozone NAAQS should not be taken lightly. The NAAQS standards have been instrumental in improving our Nation's air quality. That is right, air quality has been steadily improving in the U.S. between 1970 and 2005, total emissions of the six NAAQS pollutants have dropped by 53 percent. And measured ambient air concentrations of ozone have dropped 20 percent since 1980. This is while our gross domestic product, vehicle miles traveled, energy consumption and population have increased substantially.

So basically, our economy has been growing quite nicely, and at the same time, we have been doing a halfway decent job of reducing the six most harmful pollutants.

The gains are impressive and we want to improve upon them. But as a policy matter, we should weigh additional gains against the overall costs to communities. By now we should all be well aware that economic burdens associated with complying with more stringent standards could fall disproportionately on those least able to pay. It really gets into weighing these things that are difficult. Senator Carper did an eloquent job of explaining the health and hazmat impact and that. I wrote a note down to get the information that we have in Ohio. You have that right there, and then you have the other costs of this. And even though you are not able to weigh them, that you have to figure out just what makes the most sense.

And today, for example, there are 391 counties that are out of compliance with the standards. Twenty-five of those are in my State. EPA is now considering revising those standards. Even before the States implement programs to meet the current standards, State implementation plans for the current standards were due to the EPA just last month. In fact, from what I have heard from the folks in Ohio, they are unsure the targets can be met. And we are talking about the current ones, not the new ones.

If EPA increases the stringency of the ozone standard during this review, it will again hamper States with a new and more difficult target before the current standard is attained. The agency will have allowed no time to evaluate the environmental benefits and economic impacts of attaining the standard we have today. Since some may not be aware, but standards at the lower end of the range now under consideration would nearly triple the number of non-attainment counties across the U.S. Ohio could see as many as half our 88 counties designated as non-attainment. EPA claims that Federal programs such as the Clean Air InterState Rule and the new diesel fuel and engine regulations will bring most of the counties into attainment without additional local effort.

While Federal rules may help in some areas, I am concerned that EPA is trivializing the impact of being designated non-attainment in the first place. The negative effects of non-attainment designations are real. I am very familiar with the difficult decisions that must be made by each State to comply with them. As a former Governor who brought Ohio's counties into attainment, I know firsthand that this is an extremely complicated and resource-intensive

task. A non-attainment designation directly affects a community's economic viability.

The bottom line is that you have businesses that are there and you want them to expand. But if the costs of the emissions control are such that they feel they are excessive, you will find that they will locate somewhere else. And for sure I know, from my experience as Governor, that if you have, and you are in non-attainment, there are companies that come and they will just fly over your State and go somewhere else, because they don't want to be involved with the initial costs of the emissions that are going to be required from them.

I think that, because I don't want to take too much time here, I want to keep within my 5 minutes, you have a difficult job. And that is to try and again, weigh environment, economic, energy, try to figure out what makes the most sense and are these new rules that are going to be put in place really going to achieve additional health care benefits that will outweigh the other disincentives that would occur as a result of and a cost to people.

I have people in my town that, for example, their energy cost of natural gas is up 300 percent. I am talking about the elderly and I am talking about the poor. I think so often when we do some of our environmental things, we fail to consider that has an impact also on another side of someone's life. So it is there.

I will never forget Steubenville, Ohio. This woman came up and she spoke broken English and she said, Mr. Voinovich, she said, you know, the air is clean. But my children have all moved because there are no jobs. So I think there is a balance that we can achieve here. I think that is a Solomon-like decision you are going to have to make. We want you to do it, as Senator Carper said, based on the best information that you can get.

Thank you.

Senator CARPER. Thanks, Senator Voinovich.

Senator Boxer, Madam Chair.

OPENING STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Senator BOXER. Thank you so much, Senator Carper, for scheduling this very important hearing on ozone, often called smog.

I wanted to pick up on what Senator Voinovich said, because I think it is important. According to the law, and the Supreme Court decision, the EPA Administrator is not supposed to consider anything but the science and the health. He is not supposed to consider the economics. That is up to us. In Eastern Europe, they never paid any attention to the air, and 1 day they just shut it down, the whole economy, until they realized that would do it.

So I think what is important here is the EPA Administrator must give us the science and the health. The economics, if we want to weigh in and say, we don't care how many kids have asthma, or we are willing to see that number go up, that is up to us. Now, I for one, will never take that position. Because in California, asthma is the most common chronic disease among children, in my State. Smog kills. And EPA should do everything it can to save lives and protect the health of our children and our families.

Now, what has the EPA expert panel said? And Mr. Johnson and I had a phone conversation about this. They unanimously concluded that the current ozone standard will not protect health, period. There isn't any doubt about it. Smog pollution is a major public health problem nationwide. And again, in my State, leading cause of school absences, and the California Air Board estimated smog causes 4.7 million school absences a year statewide.

I would encourage everyone in this room who is interested in this to visit a school, any school, any grade, and ask children to raise their hand if they have asthma or if they know someone who has asthma. You will be stunned to see half to two-thirds of the hands go up. I certainly was stunned to see it.

Now, EPA Administrator Johnson has publicly stated he agrees that the current smog standard is not protective. But unfortunately, as we will hear today, EPA's ozone proposal allows for more pollution than the science supports, and it could even leave the current unsafe standard in place, which to me would be the height of immorality. The science overwhelmingly supports the closing the door on the current standard once and for all.

But instead of listening to science, as I told the Administrator in a conversation we had recently, he seems to be listening to the wish lists of the polluters. The final ozone rule must protect clean air and public health, period. Because anything less is just unacceptable to the American people.

This morning, I woke up to the news that China executed the head of the FDA over there. And I thought——

Senator CARPER. Let me just interrupt. We are not considering executing anybody here today.

[Laughter, side conversations.]

Senator BOXER. If you allow me to finish——

Senator CARPER. We are not going to commute sentences either, though, are we?

Senator BOXER. I was going to go to a very similar place, which is that we don't have people who in these high positions, who are on the take from companies and allow unsafe products on the market. Because if we did have that, they would go to jail.

The point is here, what we need to do is what the Supreme Court says, which is to consider health and science. And that is what your job is, Mr. Johnson.

Now, scientists agree EPA needs to adopt a stricter standard to protect the health of the public, especially our children. You and I share stories of our grandchildren. Those are the kids that we have to protect, and the elderly. The National Ambient Air Quality Standards are the backbone of the Clean Air Act, and they set the maximum level of an air pollutant, such as ozone, that is safe for us to breathe. Setting an appropriate standard is crucial to protecting the health of millions of Americans.

And again, I want to reiterate this, because it is the law. Ever since 1970, the Clean Air Act has required that these standards be set solely on the basis of the latest available health science. That is the job of the EPA. Anything less than that is against the law. It is unlawful. And the Supreme Court has recently confirmed that these standards are to be set based on science and health effects, nothing else. The law says the standards must protect public

health with an adequate margin of safety. That is, "The law requires that in setting such standards, EPA shall consider sensitive sub-populations," which means children and the elderly. The law says the standards must be based on the latest scientific knowledge.

Now, unfortunately, EPA has failed to heed the unanimous scientific opinion of the expert review panel created under the Clean Air Act. They are set up to provide advice regarding these standards. EPA has said it may set the standards at levels above those recommended by the review panel and has agreed to take comments about retaining the existing standard.

When Mr. Johnson and I spoke on the phone, I expressed my disillusionment with that. Because he himself had stated that the current standard is not protective, and yet in the rule, Mr. Chairman, he leaves open the door to keep it at the same level.

So EPA is doing this even though we now know ozone harms people at levels below the existing standard. We know that ozone leads to a whole pyramid of effects, lost school days, lost work days, aggravation of asthma and other chronic lung diseases, susceptibility to infection, reduced lung function, hospital admissions and even premature death.

So the people who are the youngest among us are those most vulnerable, those who stay outside longer. Adults with asthma and other lung diseases, older adults and adults who work outdoors are also very vulnerable. These facts led the independent review panel to say unanimously there is no scientific justification for retaining the current standard of 0.08 parts per million, and the panel unanimously recommended a range of .060 to .070 parts per mission, as the ozone standard. And yet the proposed range is .070 to .075, and again leaving the door open for comments to keep it at the 8 level.

So this is really unacceptable. I would ask unanimous consent to place the rest of my statement into the record, because I know you want to move forward. But I will again conclude with one sentence, which is I know repetitive. It is your job, Mr. Johnson, to set a standard that is based on the latest science. The simple act of breathing mustn't threaten anyone's life, particularly the most vulnerable among us. Thank you.

[The prepared statement of Senator Boxer follows:]

STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF CALIFORNIA

Thank you, Senator Carper, for scheduling this important hearing on ozone—often called smog. It is appropriate that we are discussing today the health threats from the ozone air pollution—during a week plagued by "code orange" unhealthy ozone level warnings for vulnerable people right here in Washington, and in many other parts of the Nation. Smog kills, and EPA should be doing everything it can to save lives and protect the health of our children and families. EPA's own expert panel of scientists has unanimously concluded that the current ozone standard won't protect public health.

Smog pollution is a major public health problem nationwide, and is often especially severe in my home State of California. It is a leading cause of school absences in my state. The California Air Resources Board has estimated that smog causes over 4.7 million school absences a year statewide. EPA Administrator Johnson has publicly stated that he agrees that the current smog standard is not protective. Unfortunately, as we will hear today, EPA's ozone proposal allows for more pollution

than the science supports, and it could even leave the current unsafe standard in place.

The science overwhelmingly supports closing the door on the current standard once and for all. Instead of listening to science, the Administrator seems to be listening to the wish lists of polluting industries. The final ozone rule must protect clean air and public health, period. Anything less is unacceptable. Scientists agree that EPA needs to adopt a stricter standard for ozone to protect the health of the public, especially vulnerable citizens including children, people with asthma, and the elderly.

The National Ambient Air Quality Standards are the backbone of the Clean Air Act. They set the maximum level of an air pollutant, such as ozone, that is safe for us to breathe. Setting an appropriate standard for ozone is crucial to protecting the health of millions of Americans. Ever since 1970, the Clean Air Act has required that these standards be set solely on the basis of the latest available health science.The Supreme Court has recently confirmed that these standards are to be set based on science and health effects.

The law says that the standards must "protect public health with an adequate margin of safety."

The law requires that in setting such standards, EPA shall consider sensitive subpopulations, which often means children and the elderly.

The law says that the standards must be based on "the latest scientific knowledge."

Unfortunately, EPA has failed to heed the unanimous scientific opinion of the expert review panel created under the Clean Air Act specifically to provide advice regarding these standards. EPA has said that it may set the standard at levels above those recommended by the review panel, and has agreed to take comments about retaining the existing standard. EPA did this even though we know now that ozone harms people at levels below the existing standard.

We know that ozone leads to a whole "pyramid" of effects, including lost school and work days, aggravation of asthma and other chronic lung diseases, increased susceptibility to infection, reduced lung function, hospital admissions, and even premature death. All children, but especially asthmatic children and those who are active outdoors, are among the most vulnerable. Adults with asthma and other lung disease, older adults and adults who work outdoors are also particularly vulnerable.

These facts led the independent review panel to say unanimously that "there is no scientific justification for retaining the current [standard] of 0.08 parts per million." As a result, the panel "unanimously recommends a range of 0.060—0.070 parts per million" as the ozone standard. Yet EPA proposed a standard in the range of 0.070—0.075 parts per million.

EPA's proposal is unacceptable. This is not the first time in recent months that EPA has ignored the science with regard to setting these kinds of standards. At the end of last year, EPA refused to revise the annual standard for particulate matter. The agency's own independent scientific review panel had taken the unusual step of reconvening to reiterate its advice that the annual standard needed to be tightened, but EPA disregarded its advice.

EPA has also decided to change its process for setting future ambient air quality standards—it will treat the independent review panel like any other commenter and it will allow political considerations to intrude into the recommendations made by staff scientists based on scientific evidence alone. Playing politics with public health is unconscionable. We need an EPA that will, above all else, make sound scientific judgments that protect public health and not polluters.

We need an EPA that will heed the clear words of the Clean Air Act, which call for an adequate "margin of safety" to protect "sensitive subpopulations" which include the most vulnerable members of society. We need an EPA that will read the clear language of the law in a way that will pass muster in the courts, unlike many of EPA's recent Clean Air Act rules.

Breathing clean air is not a luxury. EPA's standards must be set based on the latest and best science. The simple act of breathing must not threaten anyone's health or the life, most especially our elderly citizens and children who are least able to protect themselves.

Senator CARPER. Thank you, Madam Chair.

Senator Inhofe, we are delighted that you are here and you are recognized.

OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. Thank you, Mr. Chairman. Let me start off by saying that EPA's proposed ozone standard is flawed. If enacted it would have enormous consequences for our Nation, with the disadvantaged hardest hit. Defenders of tightening the ozone standard will say that the law does not take into account the economic devastation, loss of jobs, and that was stated by Chairman Boxer, and I agree, that is what the law says.

And the ruined the lives that would be left in its wake, but it should, this is something that should be changed. We should take the responsibility for doing it. Defenders of tightening the standard will say that it is not necessary that EPA rely on peer-reviewed studies or that those that are peer-reviewed are directly applicable to setting an 8-hour ozone standard. But it should, and we should demand that they do so.

The fact is, this proposal is rife with political considerations with little thought given to the people who will be forced to endure its consequences. We have here today, and by the way, I regret that I am not going to be able to be here during that panel, because I would like to hear Dr. McClellan. We have a security briefing that I have to attend.

But Dr. McClellan, the past chair of the Clean Air Scientific Advisory Committee, the CASAC, has detailed the many flaws and the questionable approaches taken in justification of this proposal. The science panel no longer offers its judgment of the scientific integrity of the process but its policy opinions. There are large scientific uncertainties regarding confounding attribution and risk.

Mr. Administrator, I find it odd that our Government would force cities to comply with standards over which they have no control. As we regulate almost every city in America under this standard, even collectively they cannot control the outcome, because you have included emissions form Mexico and Canada. What is truly perverse is that you send jobs over the border and these in turn become emissions that come back into this Country. We know that is true, we know that is happening. And we can't control our borders. We have said many times, air doesn't know borders.

I want to turn your attention to this EPA map. Oklahoma, like many States, has made tremendous progress, including of its air. Not a single county in Oklahoma, look at it, there it is right now, that is under the current standards, Oklahoma is clean. We have done that. Contrast that with California. Not a single one, Mr. Administrator. Yet your proposal will put virtually every, the entire State in non-attainment.

Hold that other one up just for a second, here. And I think probably, Senator Voinovich, you are being conservative in your estimate as to how many counties will be affected in Ohio. Because these are just the monitored counties in Oklahoma, some 12 of them. But it would also put out of attainment the surrounding counties. We know that our entire State would be out of attainment. Yet we are going from pure white to totally out of attainment.

Well, anyway, we are hearing testimony today that it will be burdensome on communities if you finalize your proposal, Mr. Admin-

istrator. Let me be clear: lost jobs and closing factories are a health risk. As others have said, access to medical care is a health risk. In disadvantaged communities, how many people will lose health coverage as a result of this rule, Mr. Administrator? If the rebuilding of communities ravaged by Katrina is slowed or stalled, tell me how this rule will enhance the quality of the people trying to return their lives to some degree of normalcy?

I am not asking you to take concerns into account that you are not allowed to by law. Instead, I am asking you to see the enormous importance of this decision and to ensure that your decision does not go beyond what you are required to do: that is, set the standard level requisite to protect the public health.

I look at this, and I know that we are talking about, I read the same thing that Chairman Boxer read about what happened in China, and that they actually executed someone. But it was just a couple weeks ago in California that Governor Schwarzenegger fired, I guess it was the California Air Resources Board chairman, because they are not doing a good job out there.

Senator BOXER. That is not right.

Senator INHOFE. Well, that is what the article says here.

So we also encourage you to focus more of your attention to where it should be, getting areas with truly dirty air into compliance with the existing law. It is why today I am reintroducing the Clean Air Attainment Enforcement Act, to provide you with the tools necessary to force areas that have ignored existing Clean Air laws and are in serious non-attainment with ozone standards as well as non-attainment with particulate matter standards. It is time the free ride ends. We can no longer trust these areas will step up to the plate voluntarily. It is time for the EPA to have the tools to ensure these dirty areas are cleaned up, cleanup their own act, and particularly under the existing standards.

Thank you, Mr. Chairman.

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Mr. Chairman, this is a timely oversight hearing. EPA's proposed ozone standard is flawed. If enacted, it would have enormous consequences for our Nation, with the disadvantaged among the hardest hit. Defenders of tightening the ozone standard will say that the law does not take into account the economic devastation, the loss of jobs, and ruined lives that will be left in its wake. But it should. And more to the point, we should.

Defenders of tightening the standard will say that it is not necessary that EPA rely on peer-reviewed studies or that those that are peer-reviewed are directly applicable to setting an 8-hour ozone standard. But it should. And we should demand that they do so.

The fact is this proposal is ripe with political considerations, with little thought given to the people who will be forced to endure its consequences. We have here today Dr. McClellan, a past Chair of the Clean Air Science Advisory Committee who has detailed the many flaws and questionable approaches taken in justification of this proposal. The science panel no longer offers its judgment of the scientific integrity of the process, but its policy opinions. There are large scientific uncertainties regarding confounding, attribution, and risk.

Mr. Administrator, I find it odd that our government would force cities to comply with standards over which they have no control. As we regulate almost every city in America under this standard, even collectively they cannot control the outcome because you have included emissions from Mexico and Canada . What is truly perverse is that as you send jobs over the border, these in turn become emissions we cannot control within our borders. But cities will be penalized nevertheless.

I want to turn your attention to this EPA map. Oklahoma , like many States, has made tremendous progress in cleaning up its air. Not a single county in Oklahoma is in violation of the ozone standards. Not a single one, Mr. Administrator. Yet your proposal will put virtually the entire State into non-attainment. How is it that EPA last year considered States like Oklahoma to have clean air that was healthy to breathe, yet next year it will consider the air unhealthy ? even as their pollution levels continue to plummet?

We are hearing testimony today that it will be burdensome on communities if you finalize your proposal, Mr. Administrator. Let me be clear: lost jobs and closing factories are a health risk. As others have said, access to medical care is a health risk in disadvantaged communities. How many people will lose health coverage as a result of this rule, Mr. Administrator?

If the rebuilding of communities ravaged by Katrina is slowed or stalled, tell me how this rule will enhance the quality of life of the people trying to return their lives to normalcy. I am not asking you to take concerns into account that you are not allowed by law. Instead, I am asking you to see the enormous importance of this decision and to ensure that your decision does not go beyond what you are required to do—that is, set the standard a level requisite to protect the public health.

I also encourage you to focus more of your attention to where it should be ? getting areas with truly dirty air into compliance with the existing law. It is why today I am reintroducing the Clean Air Attainment Enforcement Act to provide you the tools necessary to force areas that have ignored existing clean air laws and are in serious non attainment with ozone standards as well as non attainment with particulate matter standards. It is time the free ride ends. We can no longer trust these areas will step up to the plate voluntarily ? it is time EPA had the tools to ensure these dirty air areas cleaned up their act.

Thank you.

Senator CARPER. Thank you, Senator Inhofe.

Senator Voinovich, why don't you go ahead and complete your statement, and then I will recognize the Administrator.

Senator VOINOVICH. Thank you, Mr. Chairman.

We hear that the Supreme Court has said that the EPA may not consider costs when determining the NAAQS standards. But the Court also said that the standard is to be set at a level that is requisite to protect human health. That is a level that is neither higher nor lower than necessary. And I agree that the standard should be based on public health consideration. But a person's health is also influenced by their standard of living.

With respect to the scientific record underpinning EPA's proposal, I note there is a disagreement over what the science says. We have two well-respected scientists with us here today and they have different views on the scientific basis for revising the NAAQS standard. For example, Dr. Bell suggests in her testimony that there is no safe level of ozone and that even natural background concentrations may present risks to human health. On the other hand, Dr. McClellan states that in his professional judgment, EPA's proposed range is too narrow and based on a flawed and inaccurate presentation of the science.

This suggests that the scientific debate is not over. I am happy to see that the agency is taking comment on a full range of options in their review, including the possibility of retaining the current standard. The agency has until March 12th to make it decision. It is my hope that the Administrator will continue to keep an open mind as he weighs the policy options he has before him.

Thank you.

Senator CARPER. Senator Voinovich, thanks very much.

Administrator Johnson, a tough job. We appreciate your stewardship and your attention to those responsibilities and the good work that is done by the people that you are privileged to lead. Thank

you for being here with us today. We will enter your full statement into the record and we will ask you to use about 5 minutes. If you run a little bit long, we will certainly accommodate that. You are recognized at this time. Thank you for joining us.

STATEMENT OF STEPHEN L. JOHNSON, ADMINISTRATOR, U.S. ENVIRONMENTAL PROTECTION AGENCY

Mr. JOHNSON. Good morning, Chairman Carper and Madam Chair, members of the Subcommittee. Thank you for this opportunity to discuss EPA's proposal to revise the National Ambient Air Quality Standards for ground level ozone.

America's air is cleaner than just a generation ago. Under the Bush administration, this progress continues. We have come a long way in understanding that economic growth and environmental health can in fact go hand in hand. Since 1970, our gross domestic product has nearly tripled. Over this time, our energy use is up by nearly half. Our population has grown by nearly 40 percent, and vehicle traffic has almost tripled. Yet, even with this added strain on our resources, the emission of six criteria air pollutants have decreased by more than 50 percent.

The Bush administration is building on this environmental success story. Through regulations like the Clean Air InterState Rule, we are on track to reduce emissions from power plants by millions of tons, keeping pace in our steady march toward cleaner air and healthier lives for all Americans.

While our air is improving, our scientific knowledge continues to advance. For example, today we know much more about pollutants like ozone than when EPA updated our ozone standards 10 years ago. Ground level ozone, commonly referred to as smog, is one of the six criteria pollutants for which EPA has established National Ambient Air Quality Standards.

The Clean Air Act requires EPA to set standards for pollutants that can be reasonably anticipated to endanger public health or welfare and to periodically review those standards. Since 1997, when EPA last updated the ozone standards, more than 1,700 studies on the public health impacts of ozone have been conducted. This new scientific evidence indicates that ozone's impacts are more significant than we previously thought. Collectively, the research confirms that ozone is harmful to people with asthma or other lung diseases, adults who are active outdoors and the youngest and oldest members of our population.

Based upon the large body of scientific evidence, including significant new evidence concerning effects that ozone concentrations below the level of the current standard, I concluded the current standard does not protect public health with an adequate margin of safety and should be strengthened. The current primary NAAQS for ozone is .08 parts per million. After considering the advice from EPA's world-class scientists and our Clean Air Scientific Advisory Committee, I proposed to set a standard within the range of .070 to .075 parts per million.

As part of this proposal, I also invited comment on a range of primary standard levels from as low as .060 to the level of the current standard. We are accepting comments on this wider range as part of an open public comment process, which provides an opportunity

to anyone wishing to express their views on various scientific interpretations related to ground level ozone and its health effects.

I believe it is important and good policy to provide the public an opportunity to comment on this wider range and consider what they have to say. I have also proposed two options for revising the secondary ozone standard to improve protection of plants, trees and crops. The publication of the proposal in today's Federal Register marks the beginning of the official 90 day public comment period. I will issue a final decision on the standards by March 12th, 2008.

Here in America, both science and air quality have seen major improvements over the last generation. This progress in science is keeping our air quality advances moving forward. Bottom line, advances in science are leading to cleaner skies and healthier lives.

Thank you very much, and I would be happy to answer questions, Mr. Chairman.

[The prepared statement of Mr. Johnson follows:]

STATEMENT OF STEPHEN L. JOHNSON, ADMINISTRATOR, U.S. ENVIRONMENTAL PROTECTION AGENCY

Good morning, Chairman Carper and members of the Subcommittee on Clean Air and Nuclear Safety. I appreciate the opportunity to appear before you today to discuss the Environmental Protection Agency's (EPA) proposal to revise the National Ambient Air Quality Standards (NAAQS) for ground-level ozone.

INTRODUCTION

President Bush has said that breakthroughs in science and technology will help us become better stewards of the environment. I am proud of the work that EPA has been doing to promote the science and apply the technology that is helping protect our environment and improve our lives.

The air we breathe in America has consistently improved over the past 30 years. Each year, EPA looks at emissions that impact the ambient concentrations of the criteria pollutants. These annual emissions estimates are used as one indicator of the effectiveness of our programs. Between 1970 and 2006, total emissions of the six principal air pollutants dropped by 54 percent. During that same time period our nation continued to grow—gross domestic product increased 203 percent, vehicle miles traveled increased 177 percent, energy consumption increased 49 percent, and U.S. population grew by 46 percent. This success has not happened by accident. By promulgating requirements and implementing various Clean Air Act programs, and by advancing the State of our scientific understanding, EPA and its partners are continuing to make progress in reducing air pollution from both mobile and stationary sources.

The Clean Air Act requires EPA to set national ambient air quality standards for pollutants that can be reasonably anticipated to endanger public health or welfare. Under the Act, EPA develops human health-based and environmentally based air quality criteria (which evaluate and integrate the latest scientific information), for the six so-called "criteria pollutants." EPA uses the air quality criteria in setting the acceptable ambient levels for the pollutant—the NAAQS. Primary standards for these pollutants protect human health with an adequate margin of safety while secondary standards protect public welfare (that is, protect against damage to the environment or to property). EPA is required to periodically review the standards and the scientific basis of the standards to determine whether revisions are appropriate.

Ground-level ozone, commonly referred to as smog, is one of the six criteria pollutants for which EPA has established national ambient air quality standards. Ozone is rarely emitted directly into the air but is formed by the reaction of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight. VOCs are emitted from a variety of sources, including motor vehicles, chemical plants, refineries, factories, consumer and commercial products, other industrial sources, and biogenic sources. NOx is emitted from motor vehicles, power plants, and other sources of combustion. Changing weather patterns contribute to yearly differences in ozone concentrations from region to region. Ozone and the pollutants that form ozone can also be transported into an area from pollution sources found hundreds of miles upwind.

By working effectively with our state, local, and industry partners, we have made tremendous progress in reducing ambient concentrations of ozone throughout the United States. Since 1980, national average levels of ozone pollution have dropped by more than 20 percent, and in just the last 3 years, more than half of the communities out of attainment for ozone moved into attainment and now meet the current standards.

PROPOSAL SUMMARY

Since EPA last updated the ozone standards in 1997, researchers have been working to better understand how ozone affects human health and the environment. In fact, more than 1,700 studies examining the relationship between ozone exposure and human health and the environment have been published over the past decade. Many of these studies have been undertaken under the auspices of EPA's own research programs.

Some of these studies corroborate previous clinical findings showing health effects caused by exposure to ozone, while others report effects at ozone levels below the current standard. Some new studies of people with asthma indicate that they experience, relative to what was previously known, larger and more serious responses to ozone that take longer to resolve. Furthermore, new epidemiological studies, including new multi-city studies, strengthen EPA's confidence in the associations between increasing ozone exposures and health effects, including increased asthma medication use, school absenteeism, and premature mortality in those with preexisting heart and lung disease.

An extensive scientific review has preceded this proposal involving both EPA scientists and our Clean Air Scientific Advisory Committee, some of the most talented scientists in the world. I value their advice and I fully respect their judgment of the strength of the science and their views on the appropriate level at which to set NAAQS for ozone. In the course of developing this proposal, I personally spent considerable time with EPA scientists reviewing and discussing the information that has been collected.

Primary Standard

Based on the large body of evidence concerning the public health impacts of ozone pollution, including new evidence concerning effects at ozone concentrations below the level of the current standard, I proposed that the current standard does not protect public health with an adequate margin of safety and should be revised to provide additional public health protection, particularly for those with asthma or other lung diseases, adults who are active outdoors, and the youngest and oldest members of our population.

This decision was based on careful consideration of the conclusions contained in the Criteria Document, the rationale and recommendations contained in the Staff Paper, the advice and recommendations from the CASAC, and public comments to date. The current primary NAAQS for 8-hour ozone established in 1997 is 0.08 parts per million (ppm)—effectively 0.084 ppm because of our rounding conventions. After considering the advice from EPA's scientists and our Clean Air Scientific Advisory Committee, I proposed to set a standard within the range of 0.070 to 0.075 ppm. This proposal marks the beginning of an open public comment process, during which EPA is inviting comment on a range of primary standard levels from as low as 0.060 parts per million up to the level of the current standard, 0.084 ppm.

EPA is accepting comment on levels for a primary ozone standard that are outside of the specific range of the standard I proposed. While the proposal language addresses in detail our reasons for proposing 0.070 to 0.075 ppm, EPA scientists concluded that it was appropriate for me to consider a range of standards levels from somewhat below 0.080 ppm down to as low as 0.060 ppm. I am also aware of the diversity of views held by various stakeholders concerning what might constitute appropriate levels for the standard. I understand that some support a standard set lower than the range proposed and some support a higher level than I proposed or retaining the existing standard. Given such views, I believe it is prudent public policy to ask for comment specifically on a wider range. Doing so allows us to benefit from the input of the public, including the many scientists in the field who are not part of the advisory committee or the EPA staff. I fully welcome information from the public addressing whether there are other interpretations of the science or other public health policy judgments that would suggest different levels than those I put forward in the proposal.

Secondary Standard

I also proposed two alternatives for a secondary ozone NAAQS to improve protection for plants, trees, and crops. One option would be to set the standard identical to the primary standard, as we have done in the past. The other option, however, would be to set a new, separate secondary standard that addresses the kinds of ozone exposures that studies indicate can harm vegetation. This option reflects the available science indicating that cumulative, repeated exposures to ozone are an important way ozone can harm vegetation, compared to the short-term, higher exposures that can harm people.

This proposed option, known as a "W126 form," is a cumulative, seasonal standard. It focuses on ozone levels occurring over every hour from 8AM to 8PM during the summer growing season (specifically the 3-month period with the highest ozone concentrations). The form of the standard is expressed as a sum of weighted hourly ozone concentrations, and under this option, I am proposing to set that standard within a range of 7 to 21 parts per million-hours, as well as asking for comment on variations of this form and level.

NEXT STEPS

We will accept public comment for 90 days after the proposal is published in the Federal Register, and plan to hold five public hearings. These hearings will be held in Los Angeles and Philadelphia on August 30, and in Chicago, Atlanta, and Houston on September 5. This schedule puts us on track to issue final standards by March 12, 2008.

As to the implementation of any new or revised ozone standards, States have primary responsibility for ensuring attainment and maintenance of ground-level ozone standards once EPA has established them. Thus, if I ultimately decide to set final standards for ozone that are different from the current standards, EPA would work with states and other government entities to identify geographical areas that fail to meet the new standards. Under the timelines specified in the Clean Air Act and the Agency's past experience, I would expect that designations of areas that do not meet any new or revised standard would occur in 2010. By 2013, States would then be required to submit, for EPA approval, State implementation plans (SIPs) that provide for the attainment and maintenance of such standards through control programs directed to emission sources. Areas designated as non attainment would then have between 2013 and 2030 to meet any new or revised standard, depending on the severity of their air quality problem.

CONCLUSION

Once again, I want to thank you for the opportunity to be with you here today. I would be pleased to answer your questions.

Senator CARPER. Thanks, Mr. Johnson.

I am pleased to hear your testimony and welcome your comments very much. You have concluded at the current, and I am just going to go back and explore a little bit what you said and ask you to elaborate on it. You have clearly concluded that the current ozone standard does not adequately protect human health with an adequate margin of safety. Could you just explain for us a little bit more how you came to that conclusion, why you believe the proposed levels provide the adequate protection?

Mr. JOHNSON. I followed first the routine process that the agency follows with developing a regulation, particularly major regulations such as revising an ozone standard. We took advice, held public meetings with our Clean Air Scientific Advisory Committee. We had a staff document that reviewed all of the science, the over 1,700 studies, the new studies. We had option selection, where the staff presented me with their options and observations.

After carefully considering the full range of recommendations with both our Clean Air Advisory Committee as well as our world-class scientists in EPA, I concluded that the current standard is in-

sufficient to protect public health; therefore I am proposing to revise it.

Senator CARPER. Talk to us a little bit about the Clean Air Scientific Advisory Committee, which we affectionately call CASAC.

Mr. JOHNSON. Yes, that is correct.

Senator CARPER. Tell us who is on it, how many people. I understand they unanimously recommended a somewhat stronger standard, .06 parts per mission to .07. Talk to us about the composition of that committee. Who chooses the committee? And how seriously do you take their recommendations?

Mr. JOHNSON. I fully and sincerely appreciate the scientific input of the Clean Air Scientific Advisory Committee. It is an advisory committee where members are selected by, in this case, me and the agency. These are world leading experts.

Senator CARPER. Roughly how many people?

Mr. JOHNSON. It is chaired by Dr. Rogene Henderson.

Senator CARPER. How many people are on the committee, just roughly?

Mr. JOHNSON. Twenty-two.

Senator CARPER. And you choose them?

Mr. JOHNSON. We choose, the agency chooses, as part of the typical Federal Advisory Committee Act process.

Senator CARPER. And they came in and they said, unanimously, that all 22 of them believe that the appropriate range is .06 to 07?

Mr. JOHNSON. Well, I certainly agree with CASAC, and as a scientist myself, as you know, they stated, and I fully agree with them, that there is no scientific justification, based upon the current science, for retaining the current standard. And I unanimously agree with them.

Senator CARPER. All right. Yesterday, I think it was yesterday, there was some testimony over in the House of Representatives before an oversight subcommittee. I think the fellow who testified was a former surgeon general. I had not met him before, but his name is Richard Carmona. He asserted that the Administration, this Administration, often manipulated important public health policies due to political concerns and disregarded scientific evidence again and again. Some have asserted that similar non-science based influences have already influenced this rulemaking process.

As you stated, the science is very clear in this matter. Lives truly are at stake. What assurances can you give us today on this Committee that the decisions that you make regarding this standard will in fact be based on the science and on the health of our citizens, instead of the political concerns which Dr. Carmona has decried just this week?

Mr. JOHNSON. Mr. Chairman, first, let me say that as a 26 year veteran of EPA and a scientist at EPA, and now Administrator, that has not been my experience, that the Surgeon General has stated. Certainly, as Administrator for this decision and all decisions, I am going to base my decision, in this case based upon the science, making sure that I meet the statutory requirement, which is requisite to protect public health with an adequate margin of safety. That is what my proposal does, and that as we go through the public comment period and consider whatever public comments that come in, I will be basing my decision on the science, making

sure that I ultimately make the decision that is requisite to protect public health with an adequate margin of safety, which is the statutory requirement.

Senator CARPER. Good.

Before I turn the questioning over to Senator Voinovich, let me just say, you and I first met, I believe, when you had been nominated to be the Administrator. Some of my colleagues may recall that I opposed your nomination, not because I didn't admire you, like you, respect you, that I didn't think you would be a good administrator. That is not why.

But the reason why is because I wanted assurances from the Administration that they would allow you, allow EPA to model three different proposals for reducing emissions from power plants, a proposal from the Administration, a proposal from Senator Jeffords and a proposal from me. Your nomination was confirmed, we had a quite a battle, but your nomination was confirmed. I think I called you the next day——

Mr. JOHNSON. Yes, you did.

Senator CARPER [continuing].—to congratulate you and to say that was behind us and we wanted to work with you, to enable not just you to be successful, but EPA to help cleanup our air and our environment further. To your credit, you, I am sure, took some heat from others, probably within the Administration, to make sure that the modeling was done. And you called it straight. I appreciate that. I would just say, in this instance, we need to do the same. Thank you.

Mr. JOHNSON. Thank you.

Senator CARPER. Senator Voinovich.

Senator VOINOVICH. Thank you.

The EPA Green Book website says there are 391 counties located in non-attainment areas. Yet EPA maps released with the ozone standard announcement only lists 104 counties under the current standard. Is this because EPA is only counting the counties with an ozone monitor and that all the counties included in ozone non-attainment areas, which are typically drawn to include all the counties in the metropolitan statistical area? I am getting at the issue of just how many counties actually right now are in non-compliance. Under the .07 proposed rule, if that is what you come up with, how does that change?

Mr. JOHNSON. Senator, let me first State, I think it is important, that the Clean Air Act requires my decision regarding NAAQS to not consider costs, not to consider implementation issues. So this is certainly for the primary standard, a public health decision based upon science.

So while we will be moving to implementation and implementation issues for purposes of establishing or revising a NAAQS standard, I am actually prohibited to consider costs by implementation issues.

Senator VOINOVICH. That is not the question. The question is, we want to know how many counties actually are included in this, because of the fact that we have, the last head of our EPA in Ohio came here and testified and said, I don't know how we are going to comply with the current standards that have been put in place. We don't know how we are going to comply with them. And I

haven't seen the report for the State of Ohio and what their SIP plan calls for. But I hear from businesses and I hear from other people that, how are we going to do this? It is just like I have been after you for a long time about the orders that you have, the political subdivisions in Ohio, dealing with stormwater overflow, where there are going to be increased costs of millions of dollars. And the communities haven't the capacity to comply with it. How is it going to get done?

So I would like to know, and I am sure most of my colleagues would like to know just how many counties today are impacted today by the current rule. What have you heard from the States in terms of how they are going to comply? Is that correct that they just came in with their SIPs in terms of complying with the current standard?

Mr. JOHNSON. That is correct.

Senator VOINOVICH. OK, so that is just coming in now. So they really went out there and worked hard and said, here is the way we are going to do it. I would like to know what response they are giving to that. And then you are coming back to them and saying, and by the way, the science says that this current standard is inadequate, we have to go to another standard, and you have to figure out how you are going to comply with that standard.

Mr. JOHNSON. Senator, again, my focus is making sure that I am basing the decision for revising the standard based upon science without regard to cost impacts or implementation issues. I can certainly ask my staff. I don't know the numbers.

So it appears that there currently are 354 counties that are in non-attainment. Then an additional, depending upon what the final decision were made, if it were within the range I have proposed, would add an additional—as you can see, I have not focused on the issue of implementation or cost. I think it would be best, Senator, if I can get back to you on the record without giving you misinformation.

Senator VOINOVICH. It is interesting, because the communities that are going to be asked to do this have to concentrate on that. How do you, from a realistic point of view, comply with the new standard? How many years will an area have to comply with the new standards, assuming it gets at what it is and it doesn't, well, whatever the new standard you finally come up with in March of next year, how long will they have to comply with that?

Mr. JOHNSON. The schedule, which is dictated by the Clean Air Act, is that we would expect June 2009, States to recommend to the agency their areas for non-attainment, June 2010, then the agency would make a final decision, final determination on which areas are in attainment or non-attainment. Then in the year 2013, State implementation plans are due, which is 3 years after the designation. And those then between the years 2013 and 2030, States then are required to meet the standard. The reason for the range of years——

Senator VOINOVICH. Repeat that again, please?

Mr. JOHNSON. In 2013 to 2030, and the reason that there is a range is the way the Clean Air Act is constructed, depending upon where you are in non-attainment, there are additional years that are given under the Clean Air Act to help the States achieve at-

tainment. So we have to look area or county by county to see whether you are on the short end of the 2013 or all the way up to 2030.

Senator VOINOVICH. I have run out of time. Will we have another round of questions?

Senator CARPER. Yes, we will have another round, sure. Let me just say to the point my colleague was making, and I think, just to paraphrase the person in Ohio, saying, I don't know how we are going to comply, how can we do it. You know what they say in Home Depot in their advertising campaign, they say, you can do it, we can help. The States, we believe they can do it, but we need to help. Among the ways that we can help is the promulgation of the Clean Air InterState Rule, the passage of an energy bill that has strong provisions for more energy efficient, cleaner engines in our cars, trucks and vans, legislation that deals with the emissions of SOx, NOx, mercury from our power plants. Those are things that we can do and we need to do . It is not just, you promulgate the rules, you look at the science, and say, this is what we can do according to the science, this is what we have to do for health. And then we have a responsibility here, too, to work to make sure the States get the help that they need.

Senator Boxer.

Senator BOXER. Thank you so much, Senator Carper. I just wanted to underscore what you just said, because sometimes we divide this issue too much. When we talk about, for example, tackling global warming, which you alluded to in the energy bill, will we start to have clean fuels and more hybrid and plug-in hybrid and electric cars? We are looking at smog here is from cars and utilities. So we are going to have some benefits here that are going to make life a lot easier for our home counties as they strive to meet a standard that is based on health.

The other point I make to Senator Voinovich, who I deeply respect and don't in any way underestimate his concerns, is that if you can't breathe, you can't work. It is pretty simple. And if you can't go to school because you have an asthma attack, you don't do well. And you may not get as good a job. So we need to work together on this. It shouldn't be one thing battling the other. We need to make a healthy environment here for our families, so they can thrive and prosper. As Senator Carper said, we need to set a background in all this that by the policies we set we make it possible to attain these goals, they become achievable goals, which is want I want to focus on, is the goal, which we have already agreed, I am happy to say, that Mr. Johnson totally agrees, must be set on science and protecting the health.

So we know that specific studies show the lungs of even healthy adults are harmed at ozone levels below the current standard. Asthmatics, we have talked about that, the most vulnerable, you have talked about it. And you have been very strong in your language here. In your testimony you note you spent considerable time reviewing the scientific information. In your own view, doesn't the available evidence make it clear that the current standard of .08 parts per million is inadequate to protect public health with an adequate margin of safety?

Mr. JOHNSON. Yes.

Senator BOXER. OK. Then why do you hold the door open to .08 in your rule, in the Federal Register? Explain it. I don't understand it.

Mr. JOHNSON. During the development of the proposal, I invited in the public health community, members of industry, the agriculture community, a variety of others, to express their opinion to me as to what things I should be taking into consideration, again, regarding the science of the decision and what was requisite to protect public health and the environment with an adequate margin of safety. I heard from members of the public that believed very strongly that the standard needed to be maintained at its current level. I also heard from members——

Senator BOXER. Who in the public told you that?

Mr. JOHNSON. Typically it was members of industry and typically members of the public health community told me that I needed to lower the standard and in fact, many were on the lower end of the CASAC——

Senator BOXER. OK, well, let me—I have so little time—I am confused. You were very straightforward and said that the standard right now doesn't protect the public health. So I am not going to just keep on questioning you. Let me just express myself, Mr. Chairman. The Administrator has been very eloquent on the point that .08 does not meet the public health standard. And yet and still, for whatever reason, in the actual Federal Register, they are welcoming these comments. I would ask unanimous consent to place this piece of the Federal Environmental Protection Agency, this National Ambient Air Quality Standard for Ozone into the record, showing that they allow comments up to .08, which is the same level.

Senator CARPER. Without objection.

[The referenced material follows:]

Federal Register

Wednesday,
July 11, 2007

Part II

Environmental Protection Agency

40 CFR Part 50
National Ambient Air Quality Standards for Ozone; Proposed Rule

37818 **Federal Register** / Vol. 72, No. 132 / Wednesday, July 11, 2007 / Proposed Rules

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 50

[EPA-Ha-OAR-2005-0172; FRL-8331-5]

RIN 2060-AN24

National Ambient Air Quality Standards for Ozone

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: Based on its review of the air quality criteria for ozone (O_3) and related photochemical oxidants and national ambient air quality standards (NAAQS) for O_3, EPA proposes to make revisions to the primary and secondary NAAQS for O_3 to provide requisite protection of public health and welfare, respectively, and to make corresponding revisions in data handling conventions for 03.

With regard to the primary standard for O_3, EPA proposes to revise the level of the 8-hour standard to a level within the range of 0.070 to 0.075 parts per million (ppm), to provide increased protection for children and other "at risk" populations against an array of O_3 [illegible] from decreased lung function and increased respiratory symptoms to serious indicators of respiratory morbidity including emergency department visits and hospital admissions for respiratory causes, and possibly cardiovascular-related morbidity as well as total nonaccidental and cardiopulmonary mortality. The EPA also proposes to specify the level of the primary standard to the nearest thousandth ppm. The EPA solicits comment on alternative levels down to 0.060 ppm and up to and including retaining the current 8-hour standard of 0.08 ppm (effectively 0.084 ppm using current data rounding conventions).

With regard to the secondary standard for O_3, EPA proposes to revise the current 8-hour standard with one of two options to provide increased protection against O_3-related adverse impacts on vegetation and forested ecosystems. One option is to replace the current standard with a cumulative, seasonal standard expressed as an index of the annual sum of weighted hourly concentrations, cumulated over 12 hours per day (8 a.m. to 8:00 p.m.) during the consecutive 3-month period within the O_3 season with the maximum index value, set at a level within the range of 7 to 21 ppm-hours. The other option is to make the secondary standard identical to the proposed primary 8-hour standard. The EPA solicits comment on specifying a cumulative, seasonal standard in terms of a 3-year average of the annual sums of weighted hourly concentrations; on the range of alternative 8-hour standard levels for which comment is being solicited for the primary standard, including retaining the current secondary standard, which is identical to the current primary standard; and on an alternative approach to setting a cumulative, seasonal secondary standard(s).

DATES: Written comments on this proposed rule must be received by October 9, 2007.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ-OAR-2005-0172, by one of the following methods:

- *www.regulations.gov:* Follow the on-line instructions for submitting comments.
- *E-mail: a-and-r-Docket@epa.gov.*
- *Fax:* 202-566-1741.
- *Mail:* Docket No. EPA–HQ–OAR-2005-0172, Environmental Protection Agency, Mail code 6102T, 1200 Pennsylvania Ave., NW., Washington, DC 20460. Please include a total of two copies.
- *Hand Delivery:* Docket No. EPA-HQ–OAR-2005-0172, Environmental Protection Agency, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OAR-2005-0172. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *www.regulations.gov* or e-mail. The *www.regulations.gov* Web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *www.regulations.gov,* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket, visit the EPA Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.*

Docket: All documents in the docket are listed in the *www.regulations.gov index.* Although listed in the index, some information is not publicly available, e.g., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at the Air and Radiation Docket and Information Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744 and the telephone number for the Air and Radiation Docket and Information Center is (202) 566-1742.

Public Hearings: The EPA intends to hold public hearings around the end of August to early September in several cities across the country, and will announce in a separate Federal Register notice the dates, times, and addresses of the public hearings on this proposed rule.

FOR FURTHER INFORMATION CONTACT: Dr. David J. McKee, Health and Environmental Impacts Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Mail code C504-06, Research Triangle Park, NC 27711; telephone: 919-541-5288; fax: 919-541-0237; e-mail: *mckee.dave@epa.gov.*

SUPPLEMENTARY INFORMATION:

General Information

What Should I Consider as I Prepare My Comments for EPA?

1. *Submitting CBI.* Do not submit this information to EPA through *www.regulations.gov* or e-mail. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that

Senator BOXER. And I understand from OMB's website that OMB officials met at least three times with outside parties on the ozone proposal. One of the meetings with industry representatives did not include any EPA representative. That meeting took place on June 4th and involved a representative from the Vice President's office. So you have the Vice President's office, and I can tell you who was there. American Forests and Paper Association, Latham and Watkins represents industry, International Truck and Engine, and the industry witness that is here today, Mr. McClellan was there, and a law firm representing utilities and the Auto Alliance. OK? The Vice President had this meeting about the ozone proposal.

And I am just wondering why EPA wasn't there to present the science. You weren't at that meeting.

Mr. JOHNSON. I don't know why we were or were not invited. Again, I based my decision on the input of our world class scientific staff at EPA and the CASAC recommendations. And I made an independent decision. And the independent decision is that based upon the current science, that the current standard is not protective of public health. So I proposed to change it.

Senator BOXER. But yet you leave open the possibility of keeping it by the way you phrased it, for people to still comment on it. And I want to get back to this, were you aware of this meeting taking place with the industry people on June 4?

Mr. JOHNSON. I don't recall being aware of that particular meeting.

Senator BOXER. Did the Vice President ever talk to you about this, or his people, who were at this meeting, brief you on this meeting and tell you what was said?

Mr. JOHNSON. I don't recall.

Senator BOXER. You don't recall?

Mr. JOHNSON. No, I don't recall.

Senator BOXER. Can you please go back to the staff? Because I just want to make sure that they didn't do an end run and somehow influence your people. Because you know, your top-notch staff was much weaker than the outside science board, as you know. The Science Board was much tougher than your top-notch staff.

So I would like you to commit to me today that you will ask all of your staff if they were briefed on this meeting that took place on June 4th with the special interests, with the Vice President's people. Will you go back and will you please answer in writing if anyone was aware of it or was briefed on it, and what their input was, based on the meeting?

Mr. JOHNSON. To the extent that I can, I would be more than happy to respond to your question.

Senator BOXER. What do you mean, to the extent that you can?

Mr. JOHNSON. I don't know whether there are any executive privilege issues or anything else like that. So I am more than happy to——

Senator BOXER. Well, this is on the website, OMB's own website.

Mr. JOHNSON. I don't recall even the meeting or being aware of it. As I said, I will be happy to respond to the extent that I can.

Senator BOXER. OK. My interest is, after that meeting with all the special interests in the Vice President's office, was there pressure put on anyone in EPA to come out with a recommendation

that in my view is way too high when you consider what the outside science people have told you? So if you would please get back to us within a week, I would greatly appreciate it. Please inform all the members of the Committee through my office as to what occurred after the meeting.

And I will hold for a second round.

Senator CARPER. I have asked someone to go fetch a couple of the charts that Senator Inhofe was good enough to share with us earlier. Just in case they don't show up in time, let me just ask you to recall—here they are. Good. The charts are maps of the United States and one of the charts could—do you have two charts there? Put the other one up first, please.

This chart indicates, correct me if I am wrong, Mr. Johnson, but I believe this chart indicates in red, the areas in red are those areas that are in non-attainment given a standard of .08 parts per million for ozone.

Mr. JOHNSON. That looks correct.

Senator CARPER. Now, if we were to change that standard to .09 or .10, my guess is that there would be even less red, and if we go high enough for a standard, maybe .15, there would be no red. Then we could maybe feel good about the fact that everybody was in attainment.

What we wouldn't feel so good about was the fact that a lot of people are breathing air high in ozone that is going to make them sick. Sometimes we lose sight of the fact, I don't like being in non-attainment in my State, in all three counties. I don't like the fact that we are at the end of the tailpipe. There was a time when I was Governor, Senator Voinovich, you may recall this too, there was a time when I was Governor we had to literally close down the economy of my State, and still were in non-attainment, not because of what we were putting into the air, but what others were putting into the air, and all the cars, trucks and vehicles that are driving up and down the Northeast Corridor, and the pollution that is being put up to the west of us and blowing into my State.

The fact that a State or an area is in non-attainment shouldn't be taken as a badge of shame. What should be a badge of shame for us is our failure to address eliminating those areas of non-attainment. We need strong standards, strong health standards based on good science and then—let's see the next chart, please.

And then when all these areas of non-attainment pop up under a standard of anywhere from .07 to .05, which you seem to have embraced, then we have all these areas of non-attainment pop. Some are troubled by that. I am not. I would be challenged by that if I were running my State again. Mr. Werner here is from Delaware, he has a big challenge, figuring out how to get us into attainment. We are going to help him. We are going to help him in some of the ways that I have already talked about.

I would just ask you to reflect on what I just said, please.

Mr. JOHNSON. Thank you, Mr. Chairman. Again, as stated, and it is worth repeating, the decision that is before me with regard to the standard is to consider health impacts for the primary standard solely, and not consider costs and not consider implementation. Clearly, once we make that decision, then we will do everything in our power to work with our State and tribal officials and others to

help them meet the new standard. But for purposes of the standard setting, it is very clear to me that I am prohibited by law from considering cost and implementation issues.

I would just, I am not that familiar with the second chart that was put up, because I am not sure that takes into consideration a number of the items that you and Chairman Boxer have mentioned, such as the Clean Air InterState Rule, such as the diesel rules, such as our NOx SIP Call. There is a variety of steps that we have taken nationally that are in place that will be delivering real air quality results that will significantly help on ozone.

And again, I don't know whether that particular map reflects that or not.

Senator CARPER. If the panel, this advisory panel has said they think the proper range is .06 to .07, is the right place to be in terms of focus on better health, better air quality for better health, if they are right, then what that suggests is that this chart that we have up here today shows those areas of our Country, including my State, where we have work to do. We have work to do. And as much as I would like to see—we could raise the standard high enough so we could end up with a clean slate that would indicate nobody is in non-attainment. Unfortunately, if we leave the standard that high or leave it where it is, the fact that nobody is in non-attainment means that a lot of people are sick. And frankly, sicker than they need to be or ought to be.

It is a challenge for us, I would say. And I would yield to my colleague, Senator Voinovich. The challenge for us is to find a way to adhere to good science, to set a rigorous standard that is consistent with good health, and for us to find ways, working together, as Senator Boxer has said, for us to find ways working together, the Federal Government, State and local governments, the private sector, find ways we can reach these more rigorous standards, and do so in a way that doesn't disadvantage consumers and doesn't put our economy in a tailspin. We have done that before and I am convinced we can do it again.

Senator Voinovich.

Senator VOINOVICH. Thank you, Mr. Chairman. I, for the record, would like to read into the record the excerpt from submitted testimony by former Director Joe Koncelik of the Ohio EPA: "To demonstrate the impossibility of the task of meeting the standard in northeast Ohio, we have performed studies that show that even if all the industry was shut down and the area depopulated, it would just barely be able to meet the standard by 2010, the applicable deadline under the Federal rule. However, these same studies show that northeast Ohio could attain the new standard by 2015 using almost exclusively local and Federal control programs.

So the one question I have is, communities will have to meet the current standard by 2010. Is that correct?

Mr. JOHNSON. That is correct, 2010. Well, again, as staff is pointing out and as I have pointed out, it depends upon whether the particular county or area is, what its designation is, is it severe or is it——

Senator VOINOVICH. Well, anyhow, this is 2010, and one of the things Senator Carper talked about, ways that you could help, but the issue becomes, you reach 2010 and these new draconian meas-

ures come in and say, you have to do this and that. We tried to get some legislation that said if a county was in substantial compliance and moving in the right direction, that they would be given credit for that. We have never been able to clear that one up.

But if this is what the former EPA director is saying about the current rule, I just wondered what he would have to say about a new rule. And that gets to one other thing. Senator Carper and I worked very hard to get this DERA legislation passed, the Diesel Emissions Reduction Act, which is going to have an enormous impact on reducing ozone and particulate matter. And yet, the Office of Management and Budget was very, very stingy in providing money for that program and because of the continuing resolution, the fact of the matter is that absolutely nothing except maybe for school buses is going to be done on that program.

So the point is that looking at the programs that the EPA has in terms of funding programs that would help communities comply with this, looking at the Energy Department and some of the initiatives that we have about where we are spending money on these things, all of that should be taken into consideration to try and help these counties comply with just the current standards. Of course, we will need even more than that if we bring in the new standard.

I would like to ask you a very technical question, but it gets at something that several members have brought up. CASAC indicated in its March 2007 letter to the Administrator that EPA did not adequately justify its modeling approach to determine policy relevant background. As noted in the March 2000 letter by one of CASAC's ozone review panel members, actual PRB levels appear to be significantly higher than the PRB modeling estimates. This implies that the human health risk estimates made by the EPA have been overstated.

What effort has the EPA made to correct for its low PRB estimates and overestimates of human health risk and are you aware that Dr. Adams reported in his papers no statistically significant results below .08 ppm. And what was the basis for EPA substituting its own peer-reviewed reinterpretation of the Adams published works instead of using the peer-reviewed Adams results that were properly cited in this State of Science EPA Ozone Criteria document? That is a pretty complicated question, but that gets to the stuff that you are doing. Could you shed some light on that?

Mr. JOHNSON. Senator, actually, I do understand it. There are——

Senator CARPER. Good, would you explain it to me?

[Laughter.]

Mr. JOHNSON. Dr. Adams' study is one of the 1,700 studies that the agency reviewed. There was a full range of studies, clinical studies, there were epidemiology studies, multi-city epidemiology studies, as well as laboratory studies. So as the CASAC and as my staff and certainly as I looked at the recommendations, we had the benefit of 1,700 new studies on which to base our proposal.

Adams' study is an important study. It is not the only study. As I said, we looked at the full range and breadth and depth of all the studies. What is noteworthy is that among the clinical studies, which actually are the ones that are showing the health effects

that we are so concerned about, the large portion of those studies were actually conducted at the .08, which is the current level or in some cases, even above.

So looking at all the weight of information, I again concluded that based upon the current science, the current standard is insufficient to protect public health and the environment.

With regard to the background level, that has been a science issue, one that we have studied, continue to study. It is certainly our estimate that the background level is somewhere between .015 and .035 parts per million. We note that as part of our proposal. It is my recollection that we note it as that there are, that has been a science issue where people have disagreed. That is our best professional judgment on the science. But we certainly welcome comments and additional science that would add clarity to the background level.

Senator VOINOVICH. Thank you.

Chairman Boxer.

Senator BOXER. Thank you. Thank you, Senator Carper.

Administrator, this is the second NAAQS review where you didn't heed the advice of the expert science review panel that the Clean Air Act requires that you select. The first case was particulate matter, you didn't heed them then, either. And so it is troubling that you don't find persuasive the consensus in even unanimous views of your independent science experts. Why don't you give those views greater weight? Mr. Johnson. I carefully considered and certainly do appreciate the CASAC's comments and recommendations. In the case of the PM, there were, it was not a unanimous recommendation. And in fact, there were those that differed with other members of the CASAC. Our staff also had additional opinions. We had a lot of public comments. And again on the PM——

Senator BOXER. Well, I didn't say they were always unanimous. I said consensus and even unanimous views. Sometimes they were unanimous.

Mr. JOHNSON. Madam Chair, I made the decision on the PM, which is the most health protective PM standard in the history of the United States, and certainly here on ozone, what I have proposed is the most protective ozone standard in history.

Senator BOXER. I know, wait a minute. I just asked why you don't give those views greater weight. You said yourself you chose to go with your staff.

Mr. JOHNSON. No, I——

Senator BOXER. You said that at the beginning.

Mr. JOHNSON. No, what I said, Madam Chair, was that I carefully considered both CASAC and our world class scientists and what the requirement is under the law, it is requisite to protect public health with an adequate margin of safety. And as the Supreme Court indicated, neither too high nor too low. So it is a judgment, it is a policy judgment that started with the Administrator.

Senator BOXER. Yes, it is.

Mr. JOHNSON. It is my policy judgment that requisite to protect public health is within the range of .07 to——

Senator BOXER. I understand. I know it is your judgment. That is why I am asking you about it. And it is troubling to me that in

two cases, your judgment didn't go with this amazing group of people. I would ask unanimous consent to place into the record the CASAC review panel roster, if I might, Mr. Chairman.

Senator CARPER. Without objection.

[The referenced material follows:]

U.S. Environmental Protection Agency
Clean Air Scientific Advisory Committee
Ozone Review Panel
Biosketches

Henderson, Rogene	Chair
Lovelace Respiratory Research Institute	

Dr. Rogene Henderson is a Senior Scientist Emeritus at the Lovelace Respiratory Research Institute. Dr. Henderson earned her Ph.D. in chemistry from the University of Texas in 1960 and her B.S./B.A. in chemistry/biology from Texas Christian University in 1955. She was a Fulbright Scholar in physical chemistry in 1955-1956 and held fellowships at the Universities of Texas and Arkansas. Dr. Henderson's research interests are in three major areas: (1) biochemistry of the lung, particularly the surfactant lining layer — she has developed in vivo screening tests for pulmonary toxicants based on analysis of bronchoalveolar washings for biomarkers of lung injury and repair; (2) the mechanisms by which pulmonary inflammation leads to repair or to chronic disease (fibrosis, emphysema); and (3) the pharmacokinetics of inhaled xenobiotics (particularly vapors) and chemical-specific biomarkers of chemical exposure. She has recently conducted studies on the health effects of low-level sarin exposures in rats. Dr. Henderson is currently a member of: the U.S. Army Deployment Toxicology Science Working Group, a member and Vice-Chair of the Board of Scientific Councilors (BOSC) for the U.S. Environmental Protection Agency (EPA) Office of Research and Development; and a member of the American Cancer Society (ACS) Advisory Group on Cancer and the Environment. She is a former member of the NIEHS Advisory Council (1991-95), the Health Effects Institute Research Committee (1997-2005), and the National Research Council/National Academy of Sciences (NRC/NAS) Board on Environmental Studies and Toxicology (1998-2004). Other past advisory committee activities include: Member, NIH Toxicology Study Section (1982-86); Member, NRC/NAS Committee on Epidemiology of Air Pollution (1984-85); Member, New Mexico PCB Expert Advisory Panel (1985-86); Member, NAS/NRC Committee on Toxicology (1985-1991); Chair, NAS/NRC Committee on Toxicology (1992-1998); Chair, Panel on Hyperbarics and Mixtures, NAS/NRC Subcommittee on Submarine Air Quality (1986-88); Member, NAS/NRS Committee on Biological Markers (1986-89); Chair, NAS/NRC Subcommittee on Biological Markers in Pulmonary Toxicology (1986-89); Member, Advisory Committee for the Burroughs Wellcome Toxicology Scholar Award (1987-89); Member, Associated Western Universities Laboratory Advisory Board (1988-89); Member, NAS/NRC Committee on Risk Assessment Methodology (1989-91); Member, NAS/NRC Subcommittee on Spacecraft Maximum Allowable Concentrations for Space Station Contaminants (1989-94); Member, World Health Organization (WHO) Advisory Group on Use of Biological Markers in Risk Assessment (1989, 1992); Member, NAS/NRC Subcommittee on Guidelines for Estimating Acceptable Acute Exposures for Hazardous Substances (1990-92); Member, WHO Task Group on Benzene (1991); Member, EPA Science Advisory Board (SAB) Environmental Health Committee (1991-95); Chair, NAS/NRC Subcommittee on Permissible Exposure Levels for Military Jet Fuels (1992-96); Member, EPA/HERL Ad Hoc Advisory Group on Applications of Specimen Banking, Biological Monitoring and Biological Markers for Exposure Assessment (1993); Member, ILSI/EPA Committee on Dose Selection for Chronic Bioassays (1993); member, WHO Panel on Biomarkers in Australia (1993); Member, American Petroleum Institute (API) Advisory Panel on Benzene (1993); Member, EPA Advisory Panel on Revising the Ozone Criteria Document (1993); Member, NAS/NRC Subcommittee on Military Smokes and Obscurants (1994-98); Member, Scientific Advisory Panel of the Mickey Leland National Urban Air Toxics Research Center (1995-97); Invited Member of the January 1995 National Toxicology Program Workshop on "Mechanism-Based Toxicology in Cancer Risk Assessment: Implications for Research, Regulation, and Legislation;" Member of the Ad Hoc Advisory Group on Biologic Markers for EPA SAB, Environmental Health Committee (1989); Member, Naval Submarine Medical Research Laboratory Submarine Atmosphere Health Assessment Program (1995); Chair, NAS/NRC Subcommittee on Zinc Cadmium Sulfide (1995-98); Chair, NAS/NRC Committee on Risk-Based Criteria for Non-RCRA Hazardous Waste (1998-99); Member, IOM Committee to Assess Science Base for Tobacco Harm Reduction (1999-2001); Member, NAS/NRC Committee on Estimating the Public Health Benefits of Proposed Air Pollution Regulations (2000-2002); Chair, NAS/NRC Committee on Assessing Human Health Risks of Trichloroethylene ((2004-); Chair, BOSC Symposium on Risk Assessment Practices of the EPA (2004); Chair, Review Panel for the US EPA PM/O3 Research Program (2005); Co-Chair, WHO Task Group on Environmental Health Criteria for Bentonite, Kaolin and Selected Clay Minerals (2005); member, Institute of Medicine (IOM) Committee on Asbestos: Selected Health Effects (2005-). Dr. Henderson is a National Associate of the NAS. Since October 2004, she has served as the Chair of EPA's Clean Air Scientific Advisory Committee (CASAC).

Balmes, John

University of California

Dr. Balmes is a Professor of Medicine at the University of California, San Francisco (UCSF) where he is the Chief of the Division of Occupational and Environmental Medicine at San Francisco General Hospital (SFGH), Director of the Human Exposure Laboratory of the Lung Biology Center, and the Principal Investigator of the UCSF Pediatric Environmental Health Specialty Unit. He is also Professor of Environmental Health Sciences at the University of California, Berkeley where he is the Director of the Northern California Center for Occupational and Environmental Health and the Center for Excellence in Environmental Public Health Tracking. Dr. Balmes received his BA from the University of Illinois (Urbana) in 1972. He received his MD from the Mount Sinai School of Medicine of the City University of New York in 1976. He completed a Residency in Internal Medicine at the Mount Sinai Hospital at New York City in 1979 and a fellowship in Pulmonary Medicine with additional training in occupational medicine in 1982. He is board-certified in Internal Medicine and Pulmonary Medicine and actively practices pulmonary and critical care medicine at SFGH. Dr. Balmes leads a research program involving the respiratory effects of ambient air pollutants. In his laboratory at UCSF, he conducts controlled human exposure studies of the acute effects of ozone and other pollutants. At UC Berkeley, he collaborates in epidemiological studies of the chronic effects of air pollutants. He has published over 160 papers or chapters on occupational and environmental respiratory disease-related topics with many of these dealing with the potential health effects of ambient air pollutants, especially ozone. Dr. Balmes' expertise in the health effects of ambient air pollutants has been recognized by multiple awards including the following: an Environmental/Occupational Medicine Academic Award from the National Institute of Environmental Health Science (1991-1996); the Clean Air Research Award from the American Lung Association of San Francisco and San Mateo in 1997; and the Clean Air Award from the American Lung Association of California in 1999. Dr. Balmes currently serves as a member of the Research Screening Committee of the California Air Resources Board (CARB) and was a member of the Air Quality Advisory Committee of the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency from 1992-2004. He has served the U.S. Environmental Protection Agency in many capacities. In 1992, he served on the Clean Air Scientific Advisory Committee Oxides of Nitrogen Review Panel and was invited to participate in a Workshop on Health Issues on Air Quality Criteria for Ozone and Related Photochemical Oxidants. He contributed to the writing of the Air Quality Criteria Document for Ozone in 1993-1994. He was a Consultant Reviewer of the Air Quality Criteria Document for Particulate Matter in 1995, was invited to participate in a Workshop on Asthma and the Environment in 1996, and was a Consultant Reviewer of the Air Quality Criteria Document for Ozone in 2003. In addition, he served as a consultant advisor regarding epidemiologic research on the health effects of ozone to the Health Effects Institute from 1990-1992.Dr. Balmes' research program has been supported by the National Institutes of Health, the Health Effects Institute, the Centers for Disease Control and Prevention, the California Air Resources Board, and the Flight Attendants Medical Research Institute. Currently funded projects include a study of the effects of chronic exposure to ozone on lung function (NHLBI), a study of the respiratory effects of early life exposure to biomass smoke (NIEHS), a study of both short-term and long-term responses of asthmatic children to air pollutants (CARB), a study of the effects of polymorphisms in antioxidant enzymes on ozone-induced allergic airway inflammation (CARB), and a center of excellence for environmental public health tracking (CDC). Dr. Balmes is on the editorial board of the International Journal of Occupational and Environmental Health and is an active reviewer for multiple clinical and environmental health journals, including the New England Journal of Medicine, JAMA, the American Journal of Respiratory and Critical Care Medicine, the European Respiratory Journal, Occupational and Environmental Medicine, and Environmental Health Perspectives. Dr. Balmes is a member of multiple professional societies and organizations, including the American and California Thoracic Societies, the American College of Chest Physicians, the American College of Occupational and Environmental Medicine, the Society for Occupational and Environmental Health, and the International Society for Environmental Epidemiology. He was Chair of the Environmental and Occupational Health Scientific Assembly of the American Thoracic Society in 1997-1999 and President of the California Thoracic Society in 2001-2002.

Cowling, Ellis

North Carolina State University

Dr. Ellis B. Cowling is a University Distinguished Professor At-Large, Colleges of Natural Resources and Agriculture and Life Sciences, North Carolina State University (NCSU). He received his B.S. (Wood Technology, 1954) and M.S. (Forest Pathology, 1956) from the State University College of Forestry at Syracuse University; his Ph.D. (Plant Pathology/Biochemistry, 1959) from the University of Wisconsin; and his Filosofie Licensiat (1960) and Filosofie Doktor (1970) in Physiological Botany from the Institute for Physiological Botany, University of Uppsala (Sweden). Since 1995, Dr. Cowling has been a Visiting Eminent Scholar, School of Earth and Atmospheric Sciences, Georgia Institute of Technology, Atlanta, GA. From 1978 to 1991, he served as Associate Dean for Graduate Education and Research in the College of Forest Resources at NCSU. Dr. Cowling held an appointment as an Adjunct Fellow, Kennedy School of Government, Harvard University, from 1993 to 2000.Dr. Cowling is regarded as a world leader in air pollution research. He was elected to membership in the National Academy of Sciences (NAS) in 1973. Dr. Cowling is currently Director of the Southern Oxidants Study, a strategic alliance of 490 scientists in 40 universities and 42 federal, state, and industrial organizations who investigate the chemistry, meteorology, biology, and management of ozone and particulate matter pollution and its public health and ecological effects in the southeastern United States. Dr. Cowling is the co-author of two books, and has 341 publications in referenced journals and other scientific contributions.

Crapo, James

National Jewish Medical and Research Center

Dr. James Crapo is Professor of Medicine at the National Jewish Medical and Research Center (NJMRC) in Denver, CO. Dr. Crapo is also a Professor of Medicine and the Director of Ph.D. Programs for Graduate Health Care Professionals at the University of Colorado Health Sciences Center. He received his B.S. in Chemistry from Brigham Young University (1967) and his M.D. from the University of Rochester (1971). Prior to coming to NJMRC in 1996, Dr. Crapo spent over 15 years as the Chief of the Pulmonary and Critical Care Medicine Division at Duke University Medical Center. Throughout his professional career, Dr. Crapo has been active in numerous professional societies, including service on the National Heart, Lung and Blood Institute (NHLBI) Advisory Council and serving as President of the American Thoracic Society and the Fleischner Society. He is also a member of the American Society for Clinical Investigation, the Association of American Physicians, and the Society of Toxicology. In addition, Dr. Crapo is a Fellow of the American College of Chest Physicians, the American College of Physicians, and the Royal College of Physicians, Edinburgh, Scotland. He was a Consultant to the Ozone Review Panel of EPA's Clean Air Scientific Advisory Committee (CASAC) from 1984-1990. Dr. Crapo is the holder of four U.S. Patents, with five other Patents pending, and has in excess of 200 publications.

Crawford-Brown, Douglas

University of North Carolina at Chapel Hill

Dr. Douglas Crawford-Brown is Professor in Environmental Sciences and Engineering and in Public Policy, and Director of the campus-wide Carolina Environmental Program, at the University of North Carolina at Chapel Hill. Through the CEP, he coordinates environmental research, education and outreach on campus. He received his degrees in physics (BS, 1975; MS, 1977) and nuclear science (PhD, 1980) from the Georgia Institute of Technology. Dr. Crawford-Brown's His activities focus on the modeling of human health risks — primarily of carcinogens — the modeling of alternative policies to tackle a range of environmental problems, and development of tools of risk assessment for application in risk-cost-benefit assessments and uncertainty analyses. He is the author of 130 academic articles and five books on these topics. In November 2006, the EPA Administrator appointed Dr. Crawford-Brown as a member of the Clean Air Scientific Advisory Committee (CASAC). In addition, he has served on a wide variety of state, national and international commissions addressing environmental issues. These include EPA Federal advisory committees on endocrine disruptors, the National Pollution Prevention and Toxics Advisory Committee, and the National Drinking Water Advisory Committee (CCL subgroup).

Gauderman, William

University of Southern California

Dr. Gauderman is Associate Professor of Preventive Medicine at the University of Southern California (USC). He is currently director of the biostatistics core for an NIH-funded program project grant entitled "Genetics, Air Pollution and Respiratory Effects in Children and Young Adults." This project is focused on determining whether air pollution in southern California is associated with permanent deficits in lung function and with increased risk of asthma, and whether these effects are magnified in genetically susceptible subgroups. Dr. Gauderman is also principal investigator of an NIH-funded research project entitled "Statistical Approaches to the Study of Gene-Environment Interaction." In this work, he has developed statistical methods for finding and characterizing genes that interact with environmental factors to cause disease. Dr. Gauderman also collaborates with many investigators in the design and statistical analysis of several studies, including studies of colorectal and breast cancer, and studies focused on assessing exposure to air pollution. Dr. Gauderman has published 68 articles in peer-reviewed scientific journals, including journals that focus on statistical methods, epidemiology, and respiratory health. Two of his papers, related to the association between air pollution and children's lung function development, have demonstrated that exposure to air pollution can have long-term effects on children's respiratory health. This work has had a significant impact in both the scientific and regulatory communities. Dr. Gauderman received a B.A. in mathematics from California State University, Fullerton in 1986, an M.S. in biometry from USC in 1988, and a Ph.D. in biometry from USC in 1992. In addition to the above-mentioned NIH-funded projects, Dr. Gauderman is also supported through December, 2003 on a contract from the California Air Resources Board. This contract has supported The Children's Health Study, a 10-year cohort study initiated in 1993 to study the effects of air pollution on children's respiratory health. The program project grant mentioned above is based largely on continued follow-up of this Children's Health Study cohort. Dr. Gauderman also has additional support to collaborate on other health-related research projects, including support from NCI, NIEHS, NHLBI, and EPA.

Gong, Henry

University of Southern California

Dr. Henry Gong, Jr., M.D., received his B.A. (Biology) from the University of the Pacific, Stockton, CA, and his M.D. in 1973 from the University of California at Davis. He then completed a Medicine residency at Boston University Medical Center and a Pulmonary Medicine Fellowship at the University of California at Los Angeles (UCLA). Dr. Gong remained on the full-time UCLA faculty for 15 years. He was the Associate Chief of the Pulmonary and Critical Care Medicine Division, UCLA Medical Center (1985-1992), and promoted to Professor of Medicine in 1989. Dr. Gong moved to Rancho Los Amigos Medical Center (RLAMC), Downey, CA, in 1992, where he has since been the Chief of the Environmental Health Service, an established research facility investigating the health effects of air pollution. Since 1992, he is/was the Chair of the Department of Medicine, Medical Director of Respiratory Therapy, and Chair of the Research Committee (IRB) and the Continuing Medical Education Committee at RLAMC, as well as a Professor of Medicine and Preventive Medicine, University of Southern California (USC). Dr. Gong is an established, practicing Board-certified pulmonologist/internist with expertise in clinical asthma and altitude effects in patients with cardiopulmonary disorders. He has served on the Asthma Advisory Panel of Blue Cross of California since 1999. He was a Visiting Professor to Henry Ford Hospital and Medical Centers, Detroit, MI (June, 2000) and Singapore National University, Singapore (November, 2000). His long-time efforts in pollution-related health effects were recognized by his receipt of the 2000 Clean Air Award from the American Lung Association of California (September, 2000) and the Carl Moyer Award from the Coalition for Clean Air (May, 2001).Dr. Gong has written over 250 papers, chapters, or books on respiratory-related and air pollution topics, including ozone-related health effects. He was a key contributor to the monograph "Considerations for Diagnosing and Managing Asthma in the Elderly" (February, 1996, Division of Lung Diseases, NHLBI, NIH). Dr. Gong is/was on the Editorial Board of several journals (Journal of Clinical Pharmacology; The American Journal of Critical Care; Archives of Environmental Health) and a reviewer for over 20 clinical and environmental journals, including the New England Journal of Medicine, American Journal of Respiratory and Critical Care Medicine, Chest, Journal of Clinical Allergy and Immunology, Annals of Internal Medicine, Environmental Research, Archives of Environmental Health, Journal of the Air & Waste Management Association, and Environmental Health Perspectives. In addition, he has been a consultant or reviewer for numerous State, national, and other organizations, such as the Electric Power Research Institute, Southern California Edison, University of California Research Programs, U.S. Environmental Protection Agency (EPA), National Institute of Environmental Health Sciences (NIEHS), Health Effects Institute (HEI), and the Air Quality Advisory Committee of the California Environmental Protection Agency. Dr. Gong served on the Special Review Committee on "RFA 92-04, Ozone: Mechanisms of Action" (NIEHS, March, 1993) and as a Consultant/Contributor to the Air Quality Criteria for Ozone and Related Photochemical Oxidants (Revision), Environmental Criteria and Assessment Office (EPA, 1993-1994), as well as an external peer reviewer of the EPA's long-term Asthma Research Strategy (2000). Dr. Gong's research program has been supported by the U.S. EPA, NIEHS, California Air Resources Board, Electric Power Research Institute, American Lung Association, pharmaceutical firms, and other organizations. He is currently the Director and Principal Investigator of the five-year Southern California Center for Children's Environmental Health and Disease Prevention Research: Respiratory Disease and Prevention, which is co-funded by the NIEHS and U.S. EPA. Other recently-funded research involves controlled human exposures to concentrated ambient particulates and diesel exhaust (from Health Effects Institute and the EPA-supported Southern California Particle Center and Supersite) and to particulates with nitrogen dioxide (EPA). He serves on local and state air pollution committees, such as the PM10 Task Force and the Asthma and Outdoor Air Quality Consortium (South Coast Air Quality Management District). Dr. Gong is a member of numerous professional organizations or societies, such as the American Thoracic Society and Western Society for Clinical Investigation. Dr. Gong was President of the California Chapter of the American College of Chest Physicians in 1991-92. He is currently a Fellow and former Governor of Southern California of the American College of Chest Physicians.

Hanson, Paul

Oak Ridge National Laboratory

Dr. Paul J. Hanson is a Senior Research and Development Scientist of the Environmental Sciences Division, Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee. He graduated summa cum laude with a B.A. degree in biology from St. Cloud State University, St. Cloud, Minnesota, in 1981. Dr. Hanson also received M.S. and Ph.D. degrees from the University of Minnesota, St. Paul in the fields of plant and forest tree physiology, in 1983 and 1986, respectively. Dr. Hanson has conducted research on the impacts of air pollutant oxidants (ozone and hydrogen peroxide) on forest plant physiology and growth, the deposition of gaseous nitrogen compounds to plant surfaces, and the exchange of mercury vapor between terrestrial surfaces and the atmosphere. As a part of his work on the impact of ozone on northern red oak photosynthesis, ozone exposure and uptake response curves were evaluated. Dr. Hanson's current research focuses on the impacts of climatic change on the physiology, growth, and biogeochemical cycles of eastern deciduous forest ecosystems. He has authored or co-authored over 100 journal articles and book chapters, and has recently co-edited (and authored) a book titled "North American Temperate Deciduous Forest Responses to Changing Precipitation Regimes" published in 2003 as volume 166 of the Springer Ecological Studies series. Dr. Hanson was a contributing author to EPA's Air Quality Criteria Document (AQCD) for Particulate Matter (1994-1996), and the AQCD for Oxides of Nitrogen (1988-1990). Dr. Hanson served as an Associate Editor of the Journal of Environmental Quality for six years (1995-2000), and is a long-standing member of the editorial review board of Tree Physiology. He is a current member of the U.S. Department of Energy's National Technical Advisory Committee for the National Institute of Global Environmental Change (NIGEC), and has served on a number of peer-review panels for the evaluation of scientific proposals. Dr. Hanson received the 1995 Distinguished Scientific Achievement Award from the Environmental Sciences Division, Oak Ridge National Laboratory. Dr. Hanson's recently-funded grant proposals are as follows: (1) Regulation of carbon sequestration and water use in an Ozark Forest: Proposing a new strategically located Ameriflux tower site in Missouri; U.S. Department of Energy, 2003-2005; $1.4 million over three years; (2) Identifying Critical Thresholds for Plant/Ecosystem Response to Moisture Stress; U.S. Department of Energy, 2002-2004; $900,000 over three years; (3) Enriched Background Isotope Study (EBIS); U.S. Department of Energy, 2002-2004; $2.7 million over three years; (4) Mechanisms of forest ecosystem adjustments to altered precipitation: the Walker Branch Throughfall Displacement Experiment (TDE); renewal proposal 2002-2006; $2,200,000 over five years.

Harkema, Jack

Michigan State University

Jack Harkema, DVM, Ph.D., graduated with a B.S. from Calvin College, received an MS in Physiology and a DVM from Michigan State University and received a Ph.D. in Comparative Pathology from University of California-Davis. Dr. Harkema is currently a Professor of Comparative Pathology, College of Veterinary Medicine, at Michigan State University. After completing his National Institutes of Health (NIH)-sponsored Research and Residency Training Program at the University of California, Davis, CA, Dr. Harkema joined the Lovelace Inhalation Toxicology Research Institute (ITRI) in Albuquerque, NM in 1985 as an experimental pathologist. He later became the Project Manager of the Pathogenesis Group at ITRI. In 1994, Dr. Harkema joined the faculty in the College of Veterinary Medicine at Michigan State University (MSU) where he is currently a Professor of Comparative Pathology. He is an active member in the Institute of Environmental Toxicology and in the National Food Safety and Toxicology Center (NFSTC) at MSU. Dr. Harkema is the Director of the Laboratory for Experimental and Toxicologic Pathology in the NFSTC and the Director of the Mobile Air Research Laboratory at MSU. He is also the Co-Director of the MSU and the University of Michigan's Collaborative Air Research Effort (CARE).Dr. Harkema's research is designed to understand the cellular and molecular mechanisms involved in the pathogenesis of airway injury caused by the inhalation of airborne pollutants. He has research funding from the NIH, the Health Effects Institute, the MSU Foundation, the American Chemical Council, the Michigan Life Sciences Corridor Fund and various chemical and pharmaceutical industries. Besides training graduate students, residents and post-doctoral fellows in laboratory research, Dr. Harkema teaches comparative pathology of the respiratory system to veterinary students and coordinates a graduate course in toxicologic pathology. Dr. Harkema is a Diplomate of the American College of Veterinary Pathologists and a member of the Society of Toxicologic Pathologists, the Society of Toxicology, and the American Thoracic Society. Dr. Harkema's recent grant support includes Michigan Life Sciences Corridor Fund, NIH/NHLBI, NIH/NIDDK, NIH/NIEHS, the American Lung Association, the Health Effects Institute, USDA, and US-EPA.

Hopke, Philip

Clarkson University

Dr. Philip K. Hopke is the Bayard D. Clarkson distinguished professor at Clarkson University and the director of the Center for Air Resources Engineering and Science. Professor Hopke is the immediate past president of the American Association for Aerosol Research and was a member of the National Research Council's congressionally mandated Committee on Research Priorities for Airborne Particulate Matter and the Committee on Air Quality Management in the United States. He is a member of the National Research Council's U.S. Committee on Energy Futures and Air Pollution in Urban China and the United States. Professor Hopke received his B.S. in Chemistry from Trinity College (Hartford) and his M.A. and Ph.D. degrees in chemistry from Princeton University. After a post-doctoral appointment at M.I.T., he spent four years as an assistant professor at the State University College at Fredonia, NY. Dr. Hopke then joined the University of Illinois at Urbana-Champaign and subsequently came to Clarkson in 1989 as the Robert A. Plane Professor with a principal appointment in the Department of Chemistry. He has served as dean of the Graduate School, chair of the Department of Chemistry, and head of the Division of Chemical and Physical Sciences before he moved his principal appointment to the Department of Chemical Engineering in 2000

Kleinman, Michael

University of California, Irvine

Michael T. Kleinman has been studying the health effects of exposures to environmental contaminants found in ambient air for more than 30 years. He holds a MS in Chemistry from the Polytechnic Institute of Brooklyn and a Ph.D. in Environmental Health Sciences from New York University. He is a Professor and Co-Director of the Air Pollution Health Effects Laboratory in the Department of Community and Environmental Medicine at University of California, Irvine. Prior to joining the faculty at U.C.I. in 1982, he directed the Aerosol Exposure and Analytical Laboratory at Rancho Los Amigos Hospital in Downey, CA. He has published more than 85 articles in peer-reviewed journals dealing with the uptake and dosimetry of inhaled pollutants in humans and laboratory animals, and effects on cardiopulmonary and immunological systems after controlled exposures to ozone and other photochemical oxidants, carbon monoxide and ambient or laboratory-generated aerosols. He recently chaired a National Academy committee to examine issues in protecting deployed US Forces from the effects of chemical and biological weapons. Dr. Kleinman's current studies focus on cardiopulmonary effects of concentrated ambient ultrafine, fine and coarse particles. Specifically, Dr. Kleinman is currently the co-principal investigator of an NIH-funded investigation of the effects of environmental PM on children with asthma. Dr. Kleinman's also uses animal models (mice that are genetically predisposed to cardiopulmonary disease, aged rats as a model of aging human populations and a mouse model of allergic airways disease) to examine biological mechanisms of effects of inhaled air contaminants on the lungs and heart of normal and diseased individuals. Recent studies of the offspring of animals that were exposed to inhaled metal-containing particles demonstrate that in utero exposures may have important effects on the developing organism. Dr. Kleinman is a consultant to the U.S. EPA Science Advisory Board and currently serves as the Chair of the California Air Quality Advisory Committee, which reviews California's air quality criteria documents.

Legge, Allan

Biosphere Solutions

Dr. Allan Legge is currently President of Biosphere Solutions, an environmental consulting firm located in Calgary, Alberta, Canada. Prior to forming Biosphere Solutions in 1993, he was a Senior Research Scientist at the Kananaskis Center for Environmental Research at the University of Calgary from 1972 to 1990, and a Senior Research Officer in the Environmental Research and Engineering Department, Alberta Research Council from 1990 to 1993. Dr. Legge holds a B.A. in Biology and Dramatic Arts which was received from Whitman College, Walla Walla, Washington in 1965, and a Ph.D. in Plant Genetics/Ecology from Oregon State University in Corvallis, Oregon in 1971. His areas of specialization are environmental toxicology/atmospheric chemistry, and he focuses on the evaluation and assessment of the effects of the air pollutants SO2,O3, H2S,NOx,HF, PM and saline aerosols on forests and agricultural ecosystems. Dr. Legge has been a member of the EPA Science Advisory Board since 1985 and has served on the following: (1) Forest Effects Review Panel (Co-Chair), 1985; (2) Scientific and Technological Achievement Awards Subcommittee (STAA), intermittently from 1986 to 2002; and (3) Clean Air Scientific Advisory Committee (CASAC) as a consultant since 1994 on Review Panels dealing with Nitrogen Oxides, Ozone and Related Photochemical Oxidants, and Particulate Matter. He served as a member of the U.S. National Research Council Committee to Assess the North American Research Strategy on Tropospheric Ozone (NARSTO) from 1997 to 2000. Dr. Legge is an active member of the Air & Waste Management Association (AWMA), the Alberta Society for Professional Biologists, and the International Air Pollution Workshop. He was elected as a Fellow of the American Association for the Advancement of Science (AAAS) in 1992, and a Fellow of the AWMA in 2002. Dr. Legge's primary sources of recent grant and/or contract support have been from resource extraction industries (oil and gas; cement) in Canada, Alberta Environment (provincial government), non-governmental organizations and legal firms.

Lippmann, Morton

New York University School of Medicine

Dr. Lippmann is a Professor of Environmental Medicine at the New York University (NYU) School of Medicine. He holds a Ph.D. (NYU, 1967) in Environmental Health Science, an S.M. (Harvard University, 1955) in Industrial Hygiene, and a B.Ch.E. (The Cooper Union, 1954) in Chemical Engineering. At NYU, he directs a research program on Human Exposure and Health Effects, and the EPA-supported Particulate Matter Health Effects Research Center. He has been the recipient of numerous awards for his research and contributions in aerosol science and pulmonary physiology, human exposure assessment and dosimetry, chemical transformations in the atmosphere, population studies of exposure-response relationships in occupational and community cohorts, and factors affecting the toxicity of airborne fibers. Much of this research has been focused on specific chemical agents, notably ozone, sulfuric acid, and asbestos. Dr. Lippmann is a past President of the International Society of Exposure Analysis (1994-1995), past Chairman of: the American Conference of Governmental Industrial Hygienists (1982-1983); the EPA Science Advisory Board's Executive Committee (2000-2001); EPA's Advisory Committee on Indoor Air Quality and Total Human Exposure (1987-1993); and EPA's Clean Air Scientific Advisory Committee (1983-1987). He has also chaired and been a member of numerous National Research Council committees, including committees on the airliner cabin environment and the health of passengers and crew, synthetic vitreous fibers, measurement and control of respirable dust in mines, indoor pollutants, toxicity data elements, and in-vivo toxicity testing of complex mixtures. His publications include over 290 research and review papers in the scientific literature and two reference texts on environmental health science.

Miller, Frederick

Consultant

Fred J. Miller, Ph.D. is currently an independent consultant in dosimetry and inhalation toxicology. From February, 1991 until April, 2005 he was employed in various capacities at the CIIT Centers for Health Research (CIIT) and its predecessor organization, the Chemical Industry Institute of Toxicology, serving most recently as Vice President for Research. Dr. Miller received a B.A. and M.S. in Statistics from the University of Wyoming. In 1968, he began a career as a commissioned officer in the U.S. Public Health Service (PHS). As a mathematical statistician involved with the design and analysis of studies on the effects of air pollutants on animals, Dr. Miller became interested in the use of such studies for assessing human health risks. He was assigned to the U.S. Environmental Protection Agency (EPA) when it was created in 1970. In 1971, he received an EPA long-term training award, which led to his doctoral research on the transport and removal of ozone in the lungs of animals and man. He received a Ph.D. in Statistics from North Carolina State University in 1977.Dr. Miller is interested in developing and implementing research strategies and projects that permit increased utilization of animal toxicological results to evaluate the likelihood of human risk from exposure to inhaled chemicals. His primary research interests include pulmonary toxicology, respiratory tract dosimetry of gases and particles, lung physiology and anatomy, extrapolation modeling, and risk assessment. He is internationally recognized for his research on the dosimetry of reactive gases. Dr. Miller is active in professional societies and consulting on environmental health issues. The author or co-author of more than 150 publications, Dr. Miller received a number of Scientific and Technical Achievement awards from EPA and is the recipient of the PHS' Outstanding Service Medal.

Morandi, Maria

University of Texas - Houston Health Science Center

Dr. Maria Morandi is an Assistant Professor of Environmental Sciences and Occupational Health at the School of Public Health of the University of Texas at Houston. She holds a BS degree in Chemistry from the City College of New York (1978), and MS (1981) and Ph.D. (1985) degrees in Environmental Sciences from the Norton Nelson Institute of Environmental Medicine of New York University. Dr. Morandi is also certified in Industrial Hygiene (CIH) by the American Board of Industrial Hygiene. Dr. Morandi's areas of expertise include assessment of indoor, outdoor and personal air concentrations of airborne contaminants in community and occupational environments, development of methods for personal exposure monitoring of gas and particle-phase airborne chemicals, evaluation of the effects from exposure to airborne particles and ozone on human and murine alveolar macrophages, cardiovascular effects from exposure to urban particulate matter and manufactured nanoparticles in sensitive individuals, and effects from exposure to airborne particles, ozone, and air toxics in children with asthma. She has also performed statistical modeling of PM source contributions. Dr. Morandi served as a member of the Integrated Human Exposure Assessment Committee of the EPA Science Advisory Board from 1992 and 1998, and 2003 to the present time. She was as member of the Research Strategies Advisory Committee between 1998 and 2003, and served in the Clean Air Scientific Advisory Committee (CASAC) CASAC Review Panel for the ozone AQDR. Dr. Morandi has also served as member or chair of several EPA program review panels, the Agency for Toxic Substances Board of Scientific Councilors, the National Institute of Occupational Health Study Section, and the Chemical Exposures Working Group for the National Children Study (NCS). Currently, she is a member of the Board of Scientific Counselors (BOSC) of the National Toxicology Program (NIEHS). Dr. Morandi's sources of recent grant and/or other contract support funding include: (1) U.S. Environmental Protection Agency (several contracts on the use of passive dosimeters for monitoring indoor, outdoor and personal air concentrations of air toxics; a STAR grant on the effect of PM on murine and human alveolar macrophages; and an evaluation of the impact of attached garages on indoor and personal air concentrations of VOCs); (2) NIEHS on the impact of exposure of CAPs on lung surfactant using a murine neonate model; (3) the Mickey Leland National Urban Air Toxics Research Center (impact of exposure to airborne carbonyls, PM and ozone on children with asthma and the Houston Exposure to Air Toxics Study); (4) The Health Effects Institute (HEI) (a population-based exposure study, and effects from exposure to PM on endothelial dysfunction); and (5) NIOSH (for training Industrial Hygienists).

Plopper, Charles

University of California

Dr. Charles Plopper is currently a Professor in the Department of Anatomy, Physiology, and Cell Biology at the University of California, Davis, CA. He also serves as a Unit Leader (Respiratory Diseases Unit) and Director of the Inhalation Exposure Facility at the California National Primate Research Center. Dr. Plopper received a B.A. in Anthropology and Zoology (1967) and a Ph.D. in Anatomy/Cell Biology (1972) from the University of California, Davis. After completing his Ph.D., Dr. Plopper served as a biomedical research officer in the U.S. Army Medical Research Command in Denver and San Francisco. Subsequently, he held faculty positions at the University Of Hawaii School Of Medicine and the University of Kuwait School of Medicine, prior to joining the Laboratory of Pulmonary Function and Toxicology at the National Institute of Environmental Health Sciences. He has been on the faculty at the University of California, Davis, since 1979. Dr. Plopper's research interests since beginning graduate school has been to define the cellular mechanisms and processes underlying the response of the respiratory system to environmental toxicants. Current projects include: establishment of a model of childhood environmental asthma using infant rhesus monkeys exposed to ozone and known human allergens; identification of mechanisms of enhanced susceptibility of neonates to bio-activated lung toxicants; definition of cellular mechanisms which prevent repair of toxic lung injury in neonates; definition of the role of glutathione pools in cellular protection from oxidant lung injury and the development of tolerance by repeated exposure. Portions of Dr. Plopper's research have been supported by the NIEHS, NHLBI, USEPA, NIAID, Health Effects Institute, and California Air Resources Board. Dr. Plopper is the author or co-author of over 250 original publications and review articles, and recently served as co-author for the book entitled: The Lung: Development Aging and the Environment. Dr. Plopper has served on a variety of governmental and private regulatory boards. He currently serves as a member of the Scientific Advisory Boards for the NHLBI Inner City Asthma Consortium and the NHLBI Center for Fetal Gene Therapy for Lung, Heart, and Blood Diseases, and is a member of the Scientific Review Panel on Toxic Air Contaminants and the Air Quality Review Committee for the for the CAEPA (Office of Environmental Health Hazard Assessment and Air Resources Board).

Poirot, Richard

Vermont Agency of Natural Resources

Mr. Richard L. Poirot has worked as an environmental analyst in the Air Quality Planning section of the Vermont Department of Environmental Conservation since 1978. His responsibilities include developing the technical support for State Implementation Plans (SIPs) to ensure attainment and maintenance of Federal and State standards for ozone, particulate matter, and regional haze. Mr. Poirot has also developed interests in drawing inference on the nature of pollution sources from analysis of ambient measurement data, and in working in collaborative regional scientific of science/policy forums. For example, he is or has been a participant on Ambient Monitoring and Assessment Committee for the Northeast States for Coordinated Air Use Management, the Data Analysis workgroup for the Ozone Transport Assessment Group, the Science and Technical Support Workgroup for the FACA Subcommittee on Ozone, Particulate Matter and Regional Haze, the Monitoring and Data Analysis Workgroup for the Mid Atlantic/Northeast Visibility Union (MANE-VU), the EPA PM-2.5 Data Analysis workgroup, the Steering Committee for the Interagency Monitoring of Protected Visual Environments, and the US/Canada (Air Quality Agreement) Subcommittee on Scientific Cooperation. Mr. Poirot holds a B.A. degree from Dartmouth College, where he majored in geography and environmental studies.

Russell, Armistead

Georgia Institute of Technology

Dr. Armistead (Ted) Russell is the Georgia Power Distinguished Professor and Coordinator of Environmental Engineering at the Georgia Institute of Technology. Professor Russell arrived at Georgia Tech in 1996 from Carnegie Mellon University, and has expertise in air quality engineering, with particular emphasis in air quality modeling, air quality monitoring and analysis. He earned his M.S. and Ph.D. degrees in Mechanical Engineering at the California Institute of Technology in 1980 and 1985, conducting his research at Caltech's Environmental Quality Laboratory. His B.S. is from Washington State University (1979). Dr. Russell is currently on the National Research Council's Board of Environmental Studies and Toxicology, and has been a member of a number of the NRC committees, including chairing the Committee to Review EPA's Mobile Model and chairing the committee on Carbon Monoxide Episodes in Meteorological and Topographical Problem Areas, and serving on the committee on Tropospheric Ozone Formation and Measurement, the committee on ozone forming potential of reformulated fuels and the committee on Risk Assessment of Hazardous Air Pollutants. In November 2006, the EPA Administrator appointed Dr. Russell as a member of the Clean Air Scientific Advisory Committee (CASAC). Dr. Russell also serves as an expert panel member on both the CASAC Ozone Review Panel and the CASAC Ambient Air Monitoring and Methods (AAMM) Subcommittee. He previously served on three other EPA Science Advisory Board (SAB) or CASAC subcommittees: the SAB Workgroup on Air Monitoring Plan related to Hurricane Katrina (Chair); the CASAC National Ambient Air Monitoring Strategy (NAAMS) Subcommittee; and the Subcommittee on Air Quality Modeling of the Advisory Council on Clean Air Compliance Analysis. In addition, Dr. Russell served on EPA's Clean Air Act Advisory Committee (CAAAC) Subcommittee on Ozone, Particulate Matter and Regional Haze Implementation Programs. He was also a member of the North American Research Strategy for Tropospheric Ozone (NARSTO) and California's Reactivity Science Advisory Committee. Previously he was on the EPA Office of Science, Technology and Policy's Oxygenated Fuels Program Review and various National Research Council program reviews, and a committee to review a Canadian NRC program. Dr. Russell is a member of the Air and Waste Management Association (AWMA), the American Association for the Advancement of Science (AAAS), the American Society of Mechanical Engineering (ASME), Tau Beta Pi, Sigma Xi, and the American Association for Aerosol Research (AAAR). He is Associate Editor of Environmental Science and Technology. Dr. Russell has won a variety of competitions for animations he has developed that depict the dynamics of pollutants have won a variety of prizes here and abroad, and his work was selected as a finalist for the prestigious Smithsonian Award for Computing in the Environmental Sciences. Recently, Professor Russell led a multi-institutional effort to conduct air quality modeling of ozone, particulate matter and acid deposition to assist the Southern Appalachians Mountains Initiative to identify effective control strategies to improve air quality in Class I areas in the southern Appalachians. This work has been extended to detailed analysis of air quality strategies in Georgia, particulate matter modeling in the Southeast and Northeast, and development of a number of advanced numerical techniques for environmental modeling. For his service to National Research Council committees, he was recently selected as a National Associate of the National Academies.

Sheppard, Elizabeth (Lianne)

University of Washington

Dr. Lianne Sheppard is a Research Professor in the Department of Biostatistics, and the Department of Occupational and Environmental Health Sciences. She holds a Ph.D. (1992) in Biostatistics from the University of Washington. Her scientific interests include estimating the health effects of occupational and environmental exposures, air pollution health effects, observational study design, and group information in observational studies. She is an active member of the EPA Northwest Center for Particulate Matter and Health, as well as a collaborator on several occupational and environmental health studies. Her statistical methods research addresses the role of exposure and study design in estimating health effects from observational studies. Dr. Sheppard currently serves as an expert panelist on EPA's Clean Air Scientific Advisory Committee (CASAC) Ozone Review Panel. In addition, she recently completed the project "Methods for Using Group Information in Epidemiology," an R29 grant funded by NIEHS. Dr. Sheppard is principal investigator on the sub-contract "Testing the Metals Hypothesis in Spokane" funded by the Mickey Leland Center, as well as PI on two sub-projects of the PM Center: "Statistics and Data Core," and "PM Statistical Methods." She is an external scientific reviewer for the Fresno Asthmatic Children's Environment Study based at University of California, Berkeley, and for the Environmental Lung Center at National Jewish in Denver.

Speizer, Frank

Harvard Medical School

Dr. Frank E. Speizer is currently Edward H. Kass Professor of Medicine at the Channing Laboratory of the Harvard Medical School, Boston, MA. From 1988 to 2005, he served as Co-Director of the Channing Laboratory. Dr. Speizer also holds hospital appointments as a senior physician in the Department of Medicine at Brigham and Women's Hospital, Boston; MA and as senior physician in the Department of Medicine at Beth Israel Deaconess Medical Center, Boston. Dr. Speizer received his Bachelor of Arts (A.B.) degree from Stanford University in 1957, and his Doctor of Medicine (M.D.) from the Stanford University Medical School in 1960. He also holds an honorary Master of Arts (A.M.) degree from Harvard University, which was awarded in 1989. Prior to his current appointment at the Channing Laboratory, Dr. Speizer served as Associate Professor of Epidemiology (Physiology) at the Harvard School of Public Health, Boston (1978-1986), and as Associate Professor of Medicine, Harvard Medical School (1978-1986). Since 1986, he has served as both Professor of Medicine at the Harvard Medical School and as Professor of Environmental Sciences at the Harvard School of Public Health. His major professional society involvement includes serving as a Member of the International Society for Infectious Diseases and the American Thoracic Society, National Asthma Research Committee; and as Associate Editor for Environmental Research.An epidemiologist, Dr. Speizer's major research interests are environmentally- and occupationally-related acute and chronic diseases; the natural history of chronic obstructive lung disease; and epidemiologic studies of risk factors for cancer, heart disease and diabetes. He is extensively published in his disciplinary field of expertise.

Ultman, James

Pennsylvania State University

Dr. James Ultman is a Distinguished Professor, Department of Chemical Engineering and Department of Bioengineering, and Chair, of the Intercollege Graduate Degree Program in Physiology, at the Pennsylvania State University. Dr. Ultman earned his B.S. in Chemical Engineering (1965) from the Illinois Institute of Technology; and earned his M.S. (1967) and Ph.D. (1969) in Chemical Engineering, from the University of Delaware. He was an NIH Postdoctoral at the University of Minnesota from 1969-70. Dr. Ultman's areas of expertise are: chemical engineering, biomedical engineering, respiratory physiology, the measurement and simulation of the respiratory dosimetry of ozone, and the quantification of ozone reaction with respiratory antioxidants.Dr. Ultman currently serves as an expert panelist on EPA's Clean Air Scientific Advisory Committee (CASAC) Ozone Review Panel. His most-recent prior service on advisory committees includes: (1) Scientific Advisory Committee, CIIT Centers for Health Research, Research Triangle Park, NC, (2001-2003); (2) NIEHS Superfund Hazardous Substances Basic Research Program: Study Section Member (1999); (3) EPA Scientific Review Panel: Air Quality Criterion for Ozone (1993); (4) EPA Scientific Review Panel: Research Needs for Ozone (1996); (5) EPA and Basic Acrylic Monomer Manufacturers Workshop: Nasal Dosimetry-Issues and Approaches (1998); (6) EPA and Health Canada Review Panel: Formaldehyde-Assessment for Carcinogenicity (1998); and (7) NIH PPG Scientific Advisor: Mechanism of Heterogeneity in the Lungs, University of Washington (1998-present). Dr. Ultman's sources of recent grant and/or other contract support funding include: (1) "Distribution of Chlorine in Intact Human Lungs" (grant title), Chlorine Institute, 1996-1998 (Sponsor/Dates); (2) "Ozone Exposure and Dose Delivered to Human Lungs," National Institutes of Health (NIH), 1998-2003; (3) "Distribution of Ozone in Intact Human Lungs: Effect of Intersubject Variability," Health Effects Institute, 1999-2001; and (4) "Mechanism of Species-Dependent Lung Injury," NIH, 2003-2006.

Vedal, Sverre

University of Washington

Dr. Sverre Vedal is currently Professor in the Department of Environmental and Occupational Health Sciences, Division of Occupational and Environmental Medicine, at the University of Washington School of Public Health and Community Medicine. Dr. Vedal is a pulmonary physician and an epidemiologist. He received his Doctor of Medicine degree from the University of Colorado and his Master of Science (M.Sc.) degree in epidemiology from the Harvard University School of Public Health. He worked for 18 years as an academic pulmonologist at the University of British Columbia in Vancouver, and then 3 years at the National Jewish Medical and Research Center in Denver, Colorado before joining the faculty at the University of Washington in 2004. Dr. Vedal was a member of the EPA Science Advisory Board's Clean Air Scientific Advisory Committee (CASAC) until 2003 and then served on the CASAC Particulate Matter Review Panel until 2006. He now serves on the CASAC Ozone Review Panel. Dr. Vedal serves as a standing member of the Review Committee of the Health Effects Institute (HEI) and chaired the review committee for the HEI-funded National Morbidity, Mortality, and Air Pollution Study (NMMAPS) and the HEI committee that reviewed the revised time series analyses of EPA selected studies. He served as a member of the Air Quality Management in the U.S. Committee of the National Research Council and now serves on the Institute of Medicine Committee on Evaluation of the Veterans Administration's Presumptive Disability Decision-Making Process. Dr. Vedal's research interests are in the health effects of air pollution and in occupational lung disease. He is currently working on incorporating source-oriented approaches to specifying exposure to ambient air pollution in epidemiological studies, and on identifying effects of long-term exposure to components and sources of particulate matter on cardiovascular disease.

Zidek, James (Jim)

University of British Columbia

Dr. Jim Zidek is a Professor of Statistics, in the Department of Statistics, at the University of British Columbia. His areas of expertise include: environmetrics; mapping spatial pollution fields; designing environmental monitoring networks; environmental health risk analysis. Dr. Zidek received his B.Sc. (with honors) and M.Sc. from the University of Alberta in 1961 and 1963, respectively. He was awarded his Ph.D. from Stanford University in 1967. Selected distinctions for Dr. Zidek include: Fellowships for the American Statistical Association and the Institute of Mathematical Statistics; the Izaak Walton Killam Senior Fellowship, 1989/90, and the Izaak Walton Killam Research Prize, 2001; the Distinguished Achievement Medal, Environmental Statistics Section of the American Statistical Association, 2000; and the Gold Medal, Statistical Society of Canada, 2000. He is also an Elected Fellow, Royal Society of Canada, 2003. Dr. Zidek's leadership positions include: founding Head of Statistics (1984-89); Head of Statistics (1997-2002); President, Statistical Society of Canada (1988); Chair, Statistical Sciences Grant Selection Committee; NSERC, (1980); Mathematical Sciences Group Chair, NSERC (1988-91); Editor, Statistical Science, 1987-92; Editor, CRC/Chapman Hall, 1998-present; and Editor, Encyclopedia of Environmetrics, 1999-present. Since 1999, he has served on the advisory committee for EPA's Northwest Research Center for Particulate Air Pollution and Health, at the University of Washington. He also served on the Methodological Advisory Committee, Statistics Canada, from 1985 to 1987, and from1991 to 1994; and on the Councils, Institute of Mathematical Statistics (1996-99) and International Society of Bayesian Statistics (1996-98). Dr. Zidek's recent sources of grant and other contract support include: (1) ManTech Corp., Interpolating PM2.5 fields, $35,000, 00/01; (2) NSER Canada, Likelihood theory and spatial mapping, $30,000 p.a., 2002-2006; and EPSRC of the UK, Predicting personal exposure to PM10, 5000 pounds, 2002.

Zielinska, Barbara

Desert Research Institute

Dr. Barbara Zielinska currently holds the position as Research Professor and Director of the Organic Analytical Laboratory at the Division of Atmospheric Sciences of the Desert Research Institute (DRI) in Reno, Nevada. The DRI is an autonomous research division of the University and Community College System of Nevada (UCCSN). DRI was created in 1959 by a special act of the Nevada State Legislature. Under the act and subsequent actions of the University Board of Regents, DRI is charged with conducting basic and applied research in environmental science. Dr. Zielinska has been active in the air pollution field for more than 20 years and specializes in the analysis of organic compounds in ambient air and in emission sources. Her list of publications includes over 80 papers concerning the analysis of ambient and source samples for polycylic organic hydrocarbons (PAH), nitro-PAH and other toxic air pollutants. Dr. Zielinska received her M.Sc. degree from the Lodz University of Technology, Poland, and her Ph.D. degree from the Polish Academy of Sciences, both in Chemistry.

Senator BOXER. And you will see that these are the greatest scientists from all over the Country, including a couple from Canada. So I will put that into the record, because I think that is disturbing to me. And we already know that one of the rollbacks that you presided over was to take the role of the independent scientific review board and push it aside. We already know you have done that, because they are getting in your way. So now you just ignore them, I think. That is my opinion.

Now, I want to ask you about OMB. Did you take into account any of their written comments to you in your proposal?

Mr. JOHNSON. Yes, we did.

Senator BOXER. OK. Which were those?

Mr. JOHNSON. I don't recall the specifics. It is all part of the record, Madam Chair.

Senator BOXER. OK. Well, I have one here where they asked you to be careful because with the new bill on alternative fuels, it may be hard to, it may make difficult compliance with a lowered ozone NAAQS standard. So you did take into consideration, you did take that into account and yes, you did reflect their comments in the rules.

So what I am putting together here, Mr. Chairman, is this. I hate to say this, I think what is going to come out of this is a very small, very small improvement in the standard. And it is sad to me, because we know what is happening to our kids. You were eloquent on the point. I would hope that after this hearing and hearing some of our concerns, you would certainly make it clear to everyone, including the special interests who have the Vice President's ear, quite obviously, that there is no way we are going to keep it at the same .08.

You didn't do that in your request for comments. You left the door open. That is disturbing. Why would you leave the door open? It just defies common sense. If you already decided that the current standard is not protective of public health, why would you leave the door open? Your answer to me was, well, some of the public wanted to comment. Well, they could have commented on making the standard 9. There is nothing against that. But you specifically said you were leaving the door open. It is very disturbing to me.

If you ever saw a kid have an asthma attack, it is not a pretty thing, it is not a pretty picture. And I know you are compassionate to our children, and I think that is the issue. And by the way, the charts that are up there are EPA's charts. It really responded to Senator Voinovich's question, which you said you really hadn't looked at the outcome of this. But there it is. We know it is going to be tough. And we know in California that we are going to have to have some plans that move us forward, and that we will work together with our States.

But this is an opportunity. Just every few years we do this. OK? We don't do this every year. So you have to think about this, looking ahead. It seems to me, with all the improvements we are going to have out there as we fight global warming and we reduce the greenhouse gases, it is going o have a salutary impact on ozone. So let's set this at the right level. Let's not throw away the work of these people here, the outside advisors who are, really, they don't have an axe to grind. And I know Senator Carper is much sweeter

than I am in general about the environment. I know he is willing to sit down with you, as am I.

The bottom line is, we need to do what is right for our children, the elderly, the people who suffer from ozone. This isn't a theoretical exercise. And yes, if we want a strong economy, we had better have healthy families. Because we all run, we all have offices to run, and when our folks get sick, things don't go so well.

So thank you very much, Mr. Johnson. I hope that you will make it clear that you are not going to keep the status quo and that as a matter of fact, perhaps you will reconsider and get this thing down to a level where people can breathe more easily.

Thank you.

Senator CARPER. Mr. Johnson, if you would like to just very, very briefly respond, a quick closing statement, you are welcome to.

Mr. JOHNSON. Mr. Chair, Madam Chair and Senator Voinovich, again, thank you for the opportunity. I am very proud of the work that the agency has done. I do believe that our team is a world class team of not only scientists but a world class team at EPA. I am very proud that we have proposed the most protective health standard in the Nation's history for ozone. And again, I will base my decision on the best available science that is requisite to protect public health and the environment with an adequate margin of safety. You have my assurance of that.

Senator CARPER. Thank you.

Senator BOXER. Can I just say one thing, just about the future? We are looking forward to having you back before the full Committee on the 26th of October to talk about the California waiver. I hope you will consider the eloquent comments you just made. Because one way to really help us get going here is to grant that waiver, which affects so many other States. And we can get on with cleaning up the air and improving the health of our families. So I hope when you come back on the 26th, 12 other States are hanging in the balance here and want to do more than the Federal Government is doing on it.

So I hope that you will grant that waiver and that we will have a good hearing that day. Thank you.

Senator CARPER. If I can, in closing, I just want to follow up on something that Senator Boxer said a minute or two ago. I am not sure what the right number is, between .06 and .08 parts per million. I know, and clearly you know the number is not .08. I do know that there is a number that is somewhere between .06 and 08, which is also within the prescribed range suggested by the advisory committee, .06 to .07, and also within the range that your own top folks at EPA have suggested it, between .07 and 074. There is a number there that is consistent with all of those three.

My hope is that when March 12th of next year rolls around and you announce your decision that you will have at least found that one number. And if you can do better than that, God bless you.

We have another witness in our second panel who is coming up, I thought the statements, the testimony of all of the witnesses was very good. And I want to paraphrase one paragraph in the statement of Vickie Patton that I hope she will permit me to do this. But today, Administrator Johnson, you hold the trust of healthier air in your hands. Like the administrators that preceded you, you

are confronting powerful headwinds. We have heard about some of those today.

We respectfully ask that you follow the path of science in protecting human health, that you heed the course charted by EPA's own unanimous 23 member independent science advisory committee and that you be guided by EPA's own professional staff in continuing the Nation's critical race for healthier air. We ask that you carry forward the legacy entrusted to you under the Clean Air Act to protect human health from ground level ozone with an adequate margin of safety.

Go forth, do good work.

Senator VOINOVICH. Mr. Chairman, as long as we are making a final statement, I think it is denying common sense that you are operating under legislation passed by the U.S. Congress that says that you take into consideration only the health benefits of this proposed new rule. I was a member, or I was Governor and worked very hard to get the Clean Water Act amended, so that when you considered regulations in the clean water area, you did cost benefit analysis, alternative peer review, so on and so forth.

But to just say to you that is all you can do, I think defies common sense, in that you don't take into consideration whether a community can or cannot comply with these, what impact it would have on the economy of a State, if a business closes and the people don't have the jobs and they have no, they can't afford health care. There are many things that should be taken into consideration here.

Mr. Chairman, I know I am probably going to get drubbed again, but I am going to reintroduce a bill to this Senate, as I did the first two or 3 years I was here, to try and maybe get this body to understand that there should be some cost benefit analysis when we look at some of these things that you are doing. Thank you.

Senator CARPER. Thank you, Senator Voinovich.

Again, Administrator Johnson, you have been generous with your time. We thank you for your work and frankly, the work of your team at EPA and for your testimony here today and your response to our questions. We look forward to seeing you soon. Thank you.

Senator BOXER. Mr. Chairman, as the new panel comes up, so please do——

Senator CARPER. Senator Boxer.

Senator BOXER. I wanted to clear the air, so to speak, about a comment that Senator Inhofe made about a gentleman, a wonderful person in California, Robert Sawyer, who was the ARB, the Air Resources Board chairman. Senator Inhofe said he was fired because he wasn't doing a good job. And I want to place into the record, ask unanimous consent, an article that states, "The only reason Sawyer's gone is because the administration was tying his hands behind his back and not allowing him to do the job he needed to do to implement global warming." So I just want to put that in there, because he is a wonderful and very important environmentalist and scientist. Thank you.

Senator CARPER. Without objection.

[The referenced material was not received at time of print.]

Senator CARPER. Our witnesses have joined us. As far as we know, our first vote is going to start at 11:30. My goal here is to

be able to at least hear the testimony of each of our witnesses, then we will recess for a few minutes, run and vote and come right back.

We are honored today to have a really distinguished panel. Some of you come from a long distance, and we are grateful for that. We are very much looking forward to the opportunity to have a conversation with you today.

The first panelist that we are going to hear from is Dr. Michelle Bell. Dr. Bell is the Assistant Professor of Environmental Health at Yale University. Thank you for joining us. Your full testimony will be made a part of the record. We would ask you to summarize it in about 5 minutes. Dr. Bell.

STATEMENT OF MICHELLE L. BELL PhD., ASSISTANT PROFESSOR OF ENVIRONMENTAL HEALTH, SCHOOL OF FORESTRY AND ENVIRONMENTAL STUDIES, YALE UNIVERSITY

Ms. BELL. Thank you. Thank you for the opportunity to speak with you today regarding the relationship between ozone pollution and human mortality. I am Michelle Bell, Assistant Professor of Environmental Health at Yale University at the School of Forestry and Environmental Studies, with joint appointments at the School of Public Health and also the Environmental Engineering Program.

My scientific research investigates how air pollution affects human health. I am the lead author on several national studies of ozone and human mortality.

Given the pervasive high ozone levels in many parts of our Country, ozone pollution is a critically important health concern. Links between ozone and adverse health responses have been established for years. However, new scientific evidence regarding ozone's impact on mortality has been presented in recent years.

When the U.S. Environmental Protection Agency last revised the health-based ozone standards in 1997, the agency concluded that while ozone was clearly linked to many adverse health responses, more research was needed regarding ozone and human mortality. Since that time, several studies have demonstrated that this link does in fact exist.

My colleagues and I performed a national, peer-reviewed study of how day-to-day changes in ozone levels are associated with mortality rates for 95 U.S. urban communities over a 14 year period. This large data set covers over 40 percent of the U.S. population and is one of the largest ozone studies ever conducted.

We found that mortality rates were higher in these urban communities when the previous week's ozone levels were higher. Specifically, we found that a ten part per billion increase in the previous week's ozone was associated with a .52 percent increase in mortality. To put these numbers in perspective, our research implies that a ten part per billion decrease in ozone levels would avoid about 320 premature deaths each year in the New York City area and would save approximately 4,000 lives annually in the 95 communities studied. A larger reduction in ozone levels would avert even more deaths.

This may actually be an underestimate of the total impact of ozone on mortality, as our study only looked at the relationship for health for ozone exposure over the past few days, and does not con-

sider the human health risk from breathing a lifetime of air pollution.

Other researchers also found that ozone levels are associated with increased risk of mortality, including a study of 23 European cities and a study of 14 U.S. cities. In summary, several studies have provided robust scientific evidence that ozone pollution is associated with human mortality. These studies include a range of different methodologies and study locations.

In a follow up study, we investigated the impact of low ozone levels for 98 U.S. urban communities over a 14 year period. We found that even very low levels of ozone are associated with increased risks of mortality, including concentrations lower than the current EPA regulatory standard or California standard. We have conducted extensive sensitivity analysis to investigate the role of weather in the ozone and mortality relationship and our results show that the association we observed between ozone and mortality is not an artifact of high temperatures or heat waves. This conclusion was confirmed by a Harvard University study identifying an impact of ozone on human mortality independent of an effective temperature for 14 U.S. cities.

Our national studies on ozone and mortality also account for particle pollution. Results from multiple analyses consistently show that the mortality risk from ozone cannot be attributed to particulate matter pollution and other studies found similar results. The scientific findings support a mortality effect from ozone separate from the mortality effect of particles.

In conclusion, the health impacts of ozone have been vigorously studied for many years. The connection between ozone and health is well established. We now have strong scientific evidence that ozone increases risk of human mortality, even at very low levels. Other recent research has also identified effects of ozone levels lower than the current regulatory standard, such as a Yale University study of symptoms in asthmatic children.

The current State of the science is evidenced by the Clean Air Scientific Advisory Committee's unanimous conclusion that adverse health outcomes occur at the level of the current regulatory standard. Our research indicates that health benefits would result from lowering ozone concentrations even in communities with currently low levels.

I thank you for the opportunity to speak with you on this important issue.

[The prepared statement of Ms. Bell follows:]

STATEMENT OF MICHELLE L. BELL PH.D., ASSISTANT PROFESSOR OF ENVIRONMENTAL HEALTH, SCHOOL OF FORESTRY AND ENVIRONMENTAL STUDIES, YALE UNIVERSITY

INTRODUCTION

Thank you for the opportunity to speak with you regarding the relationship between tropospheric ozone pollution and mortality. I am Michelle Bell, Assistant Professor of Environmental Health at Yale University in the School of Forestry and Environmental Studies with joint appointments at the School of Public Health and the Environmental Engineering Program. My research investigates how air pollution affects human health, including the impacts of ozone pollution. I am lead author on several national studies of ozone and human mortality.

Given the pervasive high ozone levels in many parts of our country, ozone pollution is a critically important health concern. Emissions from transportation, indus-

try, and power generation contribute to ozone. Links between ozone and various adverse health responses have been established for years, such as for increased risk of hospital admissions and respiratory symptoms. However, new scientific evidence regarding ozone's impact on mortality has been presented in recent years since the last time the U.S. Environmental Protection Agency (EPA) revised the National Ambient Air Quality Standard (NAAQS) for ozone in 1997. I will focus on this new information today, which addresses four key points.

1. The relationship between ozone and mortality
2. The impact of ozone on mortality at low ozone levels
3. The role of weather
4. The role of particulate pollution

The relationship between ozone and mortality

When EPA last revised the health-based ozone standards in 1997, the agency concluded that while ozone was clearly linked to many health consequences, the scientific evidence for a link between ozone and death was unclear and that more research was needed. Since that time, several studies have demonstrated that this link does in fact exist. My colleagues at Johns Hopkins University and I performed a national study of how day-to-day changes in ozone levels are associated with mortality rates for 95 U.S. urban communities over a 14-year period, from 1987 to 2000 (Bell et al. 2004). The communities are shown in Figure 1.

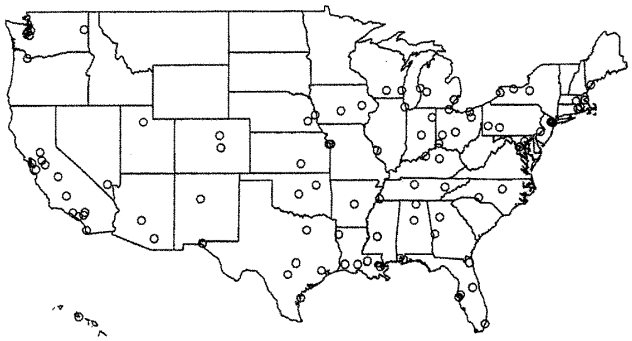


Figure 1. Map of the 95 U.S. urban communities used in a national ozone and mortality study (Bell et al. 2004)

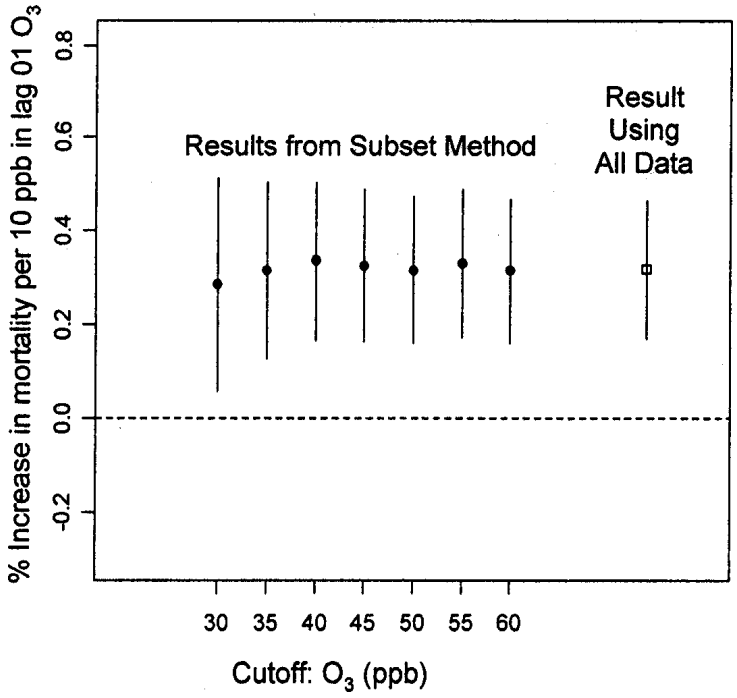
This large data set covers over 40 percent of the U.S. population and is one of the largest ozone studies ever conducted. This data set is not hypothetical or laboratory-based, but rather is based on real-world data for ozone levels, weather, and mortality. The study accounts for many factors such as weather, day of the week, and seasonal trends. We found that mortality rates are higher in urban communities when the previous week's ozone levels are higher. Specifically, we found that a 10 ppb increase in the previous week's ozone levels raised mortality rates by 0.52 percent. To put these numbers in perspective, our results imply that a 10 ppb decrease in ozone levels would avoid about 320 premature deaths in the New York City area each year, and would save approximately 4,000 lives annually in the 95 communities studied. A larger reduction in ozone levels would avert even more deaths. This may be an underestimate of the total impact of ozone on mortality as our study only looked at how risk is affected by recent exposure over the past few days and does not include the risk from a lifetime of breathing air pollution.

We also identified a link between ozone and mortality in a meta-analysis study, which pools estimates from previously conducted research to generate an overall result (Bell et al. 2005a). Other researchers have also found that daily levels of ozone are associated with increased mortality risk including additional meta-analyses studies (Anderson et al. 2004, Ito et al. 2005, Levy et al. 2005, Stieb et al. 2002, Thurston and Ito 2001), a European study of 23 cities with an average of 5.5 years of data each (Gryparis et al. 2004), and a study of 14 U.S. cities (Schwartz 2005). In summary, several studies have provided robust evidence that ozone pollution is associated with human mortality. These studies include a range of methodologies and study locations.

2. The impact of ozone on mortality at low concentrations

In a follow-up study, we investigated the impact of ozone at low concentrations for 98 U.S. urban communities over a 14-year period (Bell et al. 2005b). In particular, we were interested in determining whether there exists a threshold level, below which ozone does not adversely impact risk of mortality. We found that even very low levels of ozone are associated with increased mortality risk, including concentrations lower than current EPA regulatory standards or California's standards and nearing natural background concentrations. We found no safe level of ozone that does not affect risk of mortality.

One approach used in this analysis is the Subset Method in which only days with ozone levels below a specified value are included in the analysis. Figure 2 shows the percent increase in the risk of mortality per 10 ppb increase in the average of the same and previous days' (Lag 01) ozone levels using all data and using the subset approach, for cutoff values of 30 to 60 ppb. The points represent the central estimate, and the vertical lines reflect the 95 percent posterior interval, which relates to the certainty of the estimate. For example, the vertical line at the left side of the graph demonstrates an association between ozone and mortality, including only days with levels below 30 ppb.



3. The role of weather

A significant question regarding the ozone and mortality relationship is the role of weather. Temperature influences ozone formation through the emissions of some natural gases that contribute to ozone and through acceleration of ozone chemistry. Ozone levels tend to be higher when temperature is higher, such as during the summer. Thus, we conducted extensive sensitivity analysis to investigate the role of weather in the ozone and mortality relationship. Using a range of different techniques, we consistently found an effect of ozone on mortality, independent of temperature. In other words, our results show that the relationship we observed between ozone and mortality is not an artifact of high temperatures or heat waves. This conclusion was confirmed by a study led by Dr. Joel Schwartz of Harvard University who also identified an impact of ozone on mortality, independent of temperature, for 14 U.S. cities (Schwartz 2005).

4. The role of particulate pollution

A wealth of literature exists on the health impacts of particulate pollution. Our national studies on ozone and mortality account for particle pollution through a variety of different approaches. Results from these multiple analyses consistently show that the mortality risk from ozone cannot be attributed to particulate matter pollution. Other work also found an impact of ozone on mortality, independent of the mortality risk from particles (Bell et al. 2005a, Ito et al. 2005, Gryparis et al. 2004, Schwartz et al. 2005, Stieb et al. 2002, Thurston and Ito 2001). The scientific findings support a mortality effect from ozone, separate from the mortality effect from particles.

CONCLUSION

In conclusion, the health impacts of ozone have been vigorously studied for many years. The connection between ozone and health is well-established based on evidence from epidemiology studies using real-world data, laboratory data using human exposure, and animal models. We now have strong scientific evidence that ozone also increases risk of human mortality. This increase in mortality risk is persistent even at very low levels of ozone near natural background concentrations. Other recent research also identified effects at ozone levels lower than the current regulatory standard, such as a Yale University study finding ozone is associated with use of asthma medication and respiratory symptoms in asthmatic children under 12 years (Gent et al. 2003). The current State of the science is evidenced by the Clean Air Scientific Advisory Committee's (CASAC's) unanimous conclusion that adverse health outcomes occur at the level of the current regulatory standard. Our research indicates that health benefits would result from lowering ozone concentrations, even in communities with currently low levels.

Thank you for the opportunity to testify on this important issue.

Senator CARPER. Dr. Bell, thank you for taking the time to be here with us today and for your good work.

Next, I wish time allowed me to give a more elaborate and extensive introduction to Jim Werner, but he is a person in our State that we are enormously proud of. I feel lucky that we stole him from Missouri a number of years ago. He has served our Nation well in a variety of capacities. He is currently the Director of the Division of Air and Waste Management for the Delaware Department of Natural Resources and Environmental Control. I got to ride down with him on the train today, and was with him on another train trip not long ago with him and his son, Nicolai.

So we are happy that you are here, Jim, thank you for coming, and we look forward to your testimony.

STATEMENT OF JAMES D. WERNER, DIRECTOR, AIR AND WASTE MANAGEMENT DIVISION, DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL, STATE OF DELAWARE

Mr. WERNER. Thank you, Mr. Chairman, and thank you Madam Chairman and members of the Committee, for the opportunity to appear today. and Madam Chairman. I am going to present four basic points here. One is the need for EPA to follow the science. Second, the concern about EPA's apparent failure to heed the advice again of the Clean Air ScienceAdvisory Committee. Third, Delaware's successful efforts to meet the challenge of attaining the ozone standard. Finally, the additional efforts that need to be made.

First, where you stand on the issue, like many things, depends on where you sit. In Delaware, we sit downwind. We are at the end of a conveyor belt of pollution that is loaded often in the Midwest and unloaded after it is cooked for a couple of days in Delaware.

As Senator Voinovich said, you could shut down the economy and we would still have a challenge. That reflects the need for doing more to meet the standard, but does not change the need to follow the science on setting the standard. There is a huge difference between what you do to meet the standard, and setting it, which is simply to following the science.

The concern, though, about EPA's failure to heed the advice of the Clean Air Science Advisory Committee, as others have already articulately mentioned, started with the PM Fine rule that was really unprecedented in the nearly 30 years of EPA setting National Ambient Air Quality Standards. We would say the EPA proposal is directionally correct, but there are several concerns about the difference. First of all, the question is, why didn't EPA heed the advice? Second, why is there this difference between the .070 recommend as the ceiling and the .075 included as EPA's ceiling? There apparently is no basis in the record for supporting that, much less opening the door to retain the .080 standard, where there is no technical justification for that as well.

I think Americans depend on EPA to keep a steely eyed focused on setting the standard, following the science, period. For us States, that is very important. Because we have an enormous amount of work to do. We hold up, I think, more than half the sky in doing our efforts to meet the standard. If there is some uncertainty about whether EPA has followed the science in setting the standard, it is like somebody changing the North Star: all our ships of States become disoriented about how we are guide off the direction that EPA sets.

Last, the efforts that States have made is something that we shouldn't ignore here. I have heard concerns about what this new ozone standard will do in terms of putting other counties in nonattainment. Well, so be it, I would say. That is where the science leads you. Setting the standard doesn't change the fact that these counties already are breathing dirty air. Frankly, more than that, and not to take away from that concern, their dirty air contributes to our dirty air as well. More needs to be done.

But we have had a lot of success. We have met the 1-hour ozone standard. We just submitted our SIP to meet the 8-hour standard. We are confident we can do that. But doing more is going to require a national effort and regional efforts. That is where more complete success will come from. We couldn't have gotten as far as we did without certain efforts like CAIR, as Administrator Johnson said, without the diesel rule, without a number of other efforts, and a NOx SIP Call. But more needs to be done to help the States get there. I think the Clean Air Planning Act that Senator Carper has introduced is an important step in the right direction to get there.

But we need more. We need more Federal mobile air standards, we need improved modeling.

Last, I would like to point out the concern that States like ours have in the budget cuts that have come down from EPA on States for about 3 years straight. Our Section 103 and 105 grants have gone down. We can't do this without a little funding help from EPA. There was a recent transfer by EPA out of Air funding into tanks work. Not that tanks aren't important, there is an unfunded mandate out of the EPACT rule, which I must also deal with that

under my purview, which includes underground storage tanks. It makes it a lot harder when we are setting an ozone standard that is going to be tough to meet. We are confident we can get there with EPA's help. But we feel like we are getting the rug cut out from under us with the recent funding cuts.

Last, I would turn our attention to doing even more outside the box working to reduce air pollution, including working on land use planning. This is where we need to go in the long run to meet our standards. With that, I thank you for your attention and will be happy to take any questions.

[The prepared statement of Mr. Werner follows:]

STATEMENT OF JAMES D. WERNER, DIRECTOR, AIR AND WASTE MANAGEMENT DIVISION, DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL, STATE OF DELAWARE

Thank you Mr. Chairman and members of the Environment and Public Works' Subcommittee for the opportunity to speak with you today about EPA's recently proposed revisions to the National Ambient Air Quality Standards (NAAQS) for ground-level ozone.

I serve as the Director of the Division of Air and Waste Management in Delaware's Department of Natural Resources and Environmental Control, and served previously in a similar position in the Missouri Department of Natural Resources. Prior to these State positions, I served in the U.S. Department of Energy as Director of Strategic Planning and Analysis for the Environmental Management office, as well as a private engineering consulting firm, nongovernmental organization, and the Office of Technology Assessment (U.S. Congress). In the 1980's I served on the Board of the Delaware Valley Clean Air Council. I would also like to acknowledge the assistance of my astute Air Quality Management staff, particularly Ron Amirikian and Frank Gao who assisted in preparation of this testimony, though I bear full responsibility for the content.

After introducing some of the unique aspects of air quality management in Delaware, I will present:

- some concerns about EPA's proposed ozone NAAQS,•a summary of the success in reducing ozone concentrations and meeting ozone NAAQS, and
- some remaining challenges for states in meeting the NAAQS, including some observation on future control needs.

A. DELAWARE—SMALL, PRECIOUS AND DOWNWIND

President Thomas Jefferson dubbed Delaware "The Diamond State" because we are "small but precious." To which we would add, "downwind." Our air quality on many days is decided before people wake up in the morning and start turning on lights or driving cars. As you may know, all of Delaware is currently in non attainment for ozone, and our most populous county, New Castle, is also non-attainment for fine particulates. This situation should not obscure the fact that Delaware has made enormous progress improving air quality. We have met the 1-hour standard for ozone, and substantially reduced SO_2 emissions, especially from the oil refinery in Delaware City, which is one of the few oil refineries with the capability of processing "sour" crude. Thanks largely to a variety of State measures and EPA's Clean Air InterState Rule (CAIR) rule and implementation we expect further improvements in air quality. Although Delaware expects to meet the ozone standard by 2010, it will be a challenge and require our best efforts. Again the main reason is our down wind location. As with many policy questions, where you stand depends on where you sit. We sit at the end of a conveyor belt of air pollution that is loaded in the mid-west and delivered fully cooked on the Atlantic seaboard. Monday's rush hour in St. Louis and Cincinnati can become Wednesday's Ozone alert in Delaware.

Part of our routine function as a State air agency is to constantly monitor air quality and provide reports on the Internet. Often, our high pollution levels are measured in southern Delaware where there are more acres of soybeans than suburbs, and far more chickens than people or industrial emissions. This observation is no puzzle when you consider upwind sources. Our non-attainment status might be understandable if the whole State were industrial or heavily populated. As you well know, Mr. Chairman, the southern portion of New Castle County, and all of Kent and Sussex Counties are relatively rural. They are part of the Delmarva Pe-

ninsula, a strip of land extending below the Chesapeake and Delaware Canal, bordered on the east by the Delaware Bay and Atlantic Ocean, and bordered on the west and south by the Chesapeake Bay. In addition to Delaware, the Delmarva Peninsula contains all or portions of eight Maryland counties and two Virginia counties. Except for a few small pockets of relatively high growth, the entire Delmarva Peninsula, including Delaware's portion, is sparsely populated rural, with agriculture as the predominant business. The counties on the Delmarva Peninsula share similar emissions profiles, population densities, traffic patterns, topography and meteorology. The Peninsula counties also share similar air quality problems. Although only a few of these counties have ozone monitors, all those that do have shown numerous violations of the current 8-hour standard. In addition, photochemical modeling runs performed by the EPA have projected that most counties on the Delmarva Peninsula experience episodes similar to Delaware's in exceeding the 8-hour NAAQS.

To some, the expected non-attainment is an excuse to kick the can down the road even further. To us, it motivates us to seek other cost-effective controls to control ozone precursors and PM2.5 sources. Toward that end we have promulgated rules controlling a variety of ozone precursor sources. Delaware's permitting of a major source of Volatile Organic Compounds (VOC)—the lightening (off-loading of crude oil) of Supertankers coming out of the Atlantic Ocean into the Delaware Bay before they make their way upriver to refiners in Delaware, Pennsylvania and New Jersey—is an example of the need for each State to address its own unique circumstances. We are proud that we have been able to work constructively with Maritrans (ne' OSG, Inc.) on these lightering controls in a way that results in a win-win by requiring the lightering company to refit their entire fleet with vapor balancing equipment, and encouraging their customers to contract with compatible ships, to capture the lost VOCs, which is a product for them and their customers. Other examples include Delaware's stringent regulation of power plants and oil refinery boilers, and Delaware's participation with the OTC in the development and implementation of numerous regionally consistent control measures.

We are pursuing this variety of air pollution controls initiatives because we know the benefits outweigh the costs. We also know that national and regional solutions are necessary to help control air quality in Delaware. We persevere nonetheless knowing we cannot ask others to take action we ourselves are not willing to take.

B. SETTING NATIONAL AMBIENT AIR QUALITY STANDARDS—FOLLOW THE SCIENCE

When I last appeared before this subcommittee in November 2005, EPA was then working on a revised ozone NAAQS. At that time, we counseled EPA to "follow the science." Regrettably, EPA's subsequent proposal to revise the ozone NAAQS appears to fail to heed that admonition fully.

The Clean Air Act proscribes that primary standards "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."[1] Despite the difficulty the 8-hour ozone standard presents to Delaware, we nonetheless support EPA's proposal for a more stringent ozone NAAQS, which is what EPA's independent scientific advisory committee and others have recommended as being needed to protect public health and the environment. It is simply a matter of supporting the integrity of the Clean Air Act, and the air quality management process of which we are a part.

It may surprise some people, given Delaware's challenge in attaining the current standard, that we strongly support EPA's proposal to revise downward the ozone NAAQS. We are the ones who bear the burden of sitting across the table from the people who we must ask to take further control measures, many of whom have already installed some controls. We are "closer to the ground" and deal directly on a daily basis with the business who must take action to further reduce emissions, and the citizens who need options to current auto emissions dependent travel and the current fleet of cars. In a small State like Delaware, these are our friends and neighbors and families affected by the cost of controls. It is also our friends and neighbors and families affect by dirty air. The reason we support downward direction of the ozone NAAQS revision—despite the difficulties—is the distinction between the process of setting standards and states' dominant role in determining how to meet those standards.

[1] 42 U.S.C. 4209(b)(1)

1. EPA Has Recently Failed to Follow the Historic Pattern of Heeding Science Advisory Board Advice

On June 20, 2007 EPA announced its proposal to "revise the level of the 8-hour standard to a level within the range of 0.070 to 0.075 parts per million (ppm)."[2] Moreover, the Agency's proposal indicated intent "to specify the level of the primary standards to the nearest one-thousandth ppm" (i.e., 0.070 ppm would mean exactly that, not rounded up to 0.0074 ppm).

In proposing this slightly more stringent standard, EPA has generally followed the science, in being "directionally correct"—down not up. EPA's proposed standard overlaps with, but is not fully consistent with, the recommendation of the Clean Air Science Advisory Committee (CASAC). This inconsistency raises some areas of concern I would like to highlight briefly.

We are concerned about the potential implications of EPA unprecedented recent actions that fail to follow the advice of the Clean Air Science Advisory Committee (CASAC) of the Science Advisory Board (SAB). This proposed ozone NAAQS is the second instance where EPA has not followed the recommendation of the CASAC; the first example was the 2006 NAAQS for fine particulates.

Congress required in the 1977 CAA, that an independent scientific review committee (i.e., CASAC of the SAB) ". . . complete a review of the criteria. . . and the national and secondary ambient air quality standards—and shall recommend to the Administrator any new—standards and revisions of existing criteria and standards as may be appropriate. . . ."[3] Since 1979[4] the CASAC has been making recommendation to EPA, and EPA has generally followed those recommendations in setting NAAQS. After 28 years and dozens of major recommendations, it is troubling that EPA has diverged twice from CASAC recommendations in as many years. The $PM_{2.5}$ standard proposed in January 2006[5] and finalized in October 2006[6] was the first time EPA failed to heed to recommendations of the CASAC.[7] In this case of the $PM_{2.5}$ standard, EPA highlighted the lack of a unanimous consensus among CASAC panel members, although only 2 out of 22 members dissented.

In the wake of this historic change in course, EPA's recent ozone NAAQS proposal raises some concern about the extent to which EPA is giving adequate consideration to the scientific recommendations of it own scientific advisory committee.

In the case of the ozone NAAQS, the divergence between EPA's proposal and the CASAC recommendations was not as great the $PM_{2.5}$ NAAQS. The range of concentrations in EPA's proposed ozone NAAQS (0.070 to 0.075) ppm at least intersected with the CASAC recommendation (0.060 to 0.070). CASAC's ceiling was EPA's floor.

It is unclear what EPA's scientific basis is for proposing a range from 0.070 to 0.075, in light of the explicit CASAC recommendation not to exceed 0.070 ppm. Specifically, in October 2006, after EPA's second draft Staff Paper, the CASAC wrote to the Agency:

". . . the CASAC unanimously recommends a range of 0.060 ppm to 0.070 ppm for the primary ozone NAAQS."[8]

After EPA's Final Staff paper, the CASAC wrote again to EPA:

"Ozone Panel Members were unanimous in recommending that the level of the current primary ozone standard be lowered from 0.08 ppm to no greater than 0.070 ppm."[9]

Despite these repeated CASAC recommendations, EPA has proposed an ozone NAAQS range of 0.070 to 0.075 ppm.

It is also unclear what EPA's technical justification is for inviting comments on retaining the current standard when it has been found to be unprotective by all

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[2] U.S. EPA announcement on June 21, 2007, Fed. Reg. Notice available at http://www.epa.gov/ttn/naaqs/standards/ozone/data/2007—06—o3npr.pdf not published as of July 6, 2007 (Hereinafter "EPA ozone NPR), at 1, 21, 241, and 253.

[3] 42 U.S.C. 7409(d)(2)

[4] Butterfield, Fred, EPA CASAC Designated Federal Officer, Personal Communication, July6, 2007

[5] EPA National Ambient Air Quality Standards for Particulate Matter; 71 Fed.Reg. 2619, January 17, 2006 (amending 40 CFR Part 50).

[6] EPA NAAQS PM; 71 Fed.Reg. 61144, October 17, 2006 (amending 40 CFR Part 50).

[7] Henderson, Rogene, CASAC chair, Letter to EPA Administrator Johnson; CASAC's Recommendations Concerning Regarding Proposed NAAQS for Particulate Matter, (EPA-CASAC–07–01), March 21, 2006.

[8] Henderson, Rogene, CASAC chair, Letter to EPA Administrator Johnson: CASAC;'s Review of the Agency's Second Ozone Staff Paper, (EPA-CASAC–07–01), October 24, 2006.

[9] Henderson, Rogene, CASAC chair, Letter to EPA Administrator Stephen Johnson: CASAC's Review of the Agency's Final Ozone Staff Paper", (EPA-CASAC–07–02), March 26, 2007.

groups who have examined the issue. In its October 2006 letter to EPA, the CASAC ozone panel unanimously concluded that a 0.08 standard could not be justified scientifically:

"[T]he [CASAC] Ozone Panel is in complete agreement both that: the EPA staff conclusion arguing that 'consideration could be given to retaining the current 8-hour ozone standard'; is not supported by the relevant scientific data; and that the current primary 8-hour standard of 0.080 ppm needs to be substantially reduced to be protective of public health, particularly in sensitive subpopulations."[10]

This finding by CASAC was further supported by a group of more than 100 scientists and physicians, who wrote:

"[W]e strongly and solemnly request that you follow the recommendations of the Clean Air Scientific Advisory Committee and reduce the 8-hour primary ozone standard to a range between 0.060 and 0.070 ppm."[11]

And in a remarkable show of collective agreement, the Ozone Transport Commission, composed of states with a very broad range of views, wrote to EPA, noting:

"The [Clean Air Act] calls on EPA to rely heavily on the science and CASAC's recommendation in setting both the primary and secondary NAAQS. OTC supports the work of the CASAC and urges EPA to give great weight to the recommendations of the CASAC for a revisions of the ozone NAAQS as set forth in its March 26, 2007 letter to Administrator Johnson."[12]

In part of its June 2006 proposal, EPA appears to accept the scientific advice:

"The Administrator judges that there is important new evidence demonstrating that exposures to O3 at levels below the level of the current standard are associated with a broad array of adverse health effects, especially in at-risk populations."[13]

And EPA adds solid support for rejecting the current 8-hour standard:

"Upon meeting the current 8-hour standard, the median estimates are that about 610,000 children would experience a moderate or greater lung function response 1 or more times for the aggregate of the 12 urban areas over a single O3 season. . . and that there would be almost 3.2 million occurrences. Thus, on average it is estimated that there would be about 5 occurrences per O3 season per responding child for air quality just meeting the current 8-hour standard across the 12 urban areas."[14] [and T]he Administrator judges that there is important new evidence demonstrating that exposures to O3 at levels below the level of the current standard are associated with a broad array of adverse health effects, especially in at-risk populations."[15]

Nonetheless, EPA appears to roll out the red carpet to naysayers who would seek to dispute this broadly based scientific conclusion:

"EPA solicits comment on alternative levels up to an including retaining the current 8-hour standard of 0.080 ppm."[16]

Perhaps it is part of legal strategy, rather than stemming from some unseen scientific basis, as a method of trying "smoke out" opposition arguments early in preparation for litigation. We wish EPA well in this endeavor, though it is unlikely to dampen the enthusiasm of K-Street where billable hours can be justified by merely delaying the inevitable adoption of a NAAQS based on solid science. We agree with EPA's assertion that "review of this information has been extensive and deliberate."[17] Obviously, litigants have due process rights that are likely to be exhausted, and in the case of commercial transaction or property takings, no stone should be unturned in giving parties their day in court. What frustrates those of us in the public health business is that when a rule being delayed affects the lives and health of all Americans, especially children, there is a moral dimension that is ignored in the process.

We know that the road to this standard has been long and tortuous, beginning with the promulgation of the existing "8-hour standard" in 1997[18], and suffering a near-death experience for EPA rule writers. Ultimately both EPA's authority to pro-

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[10]Henderson, Rogene, CASAC chair, Letter to EPA Administrator Johnson: CASAC;'s Review of the Agency's Second Ozone Staff Paper, (EPA-CASAC–07–01), October 24, 2006.

[11]Levy, Jonathan I., Kent Pinkerton, and William Rom (also signed by more 100 scientists and physicians), Letter to EPA Administrator Johnson, Broad Scientific Consensus to Lower Ozone Air Quality Standard and Close the Rounding Loophole, April 4, 2007.

[12]Ozone Transport Commission, signed by David Paylor, OTC Chair and Director of Virginia DEP, June 6, 2007.

[13]EPA ozone NPR at 203.

[14]EPA ozone NPR at 166.

[15]EPA ozone NPR at 203.

[16]EPA ozone NPR at 1–2.

[17]EPA ozone NPR at 28.

[18](62 Fed.Reg. 38856) July 18. 1997 (amending 40 CFR 50)

mulgate an ozone NAAQS, and to do so without regard to cost considerations, was upheld by the Supreme Court.[19] EPA deadline for setting the new ozone NAAQS was set by Consent Decree in December 2005.[20] These years of litigation following EPA's 1997 proposed standard were after decades of mounting scientific evidence that it was not only the concentration of ozone exposure that determined the effect on public health and the environment, but also the duration of exposure. We have come a long way since pollution was measured in "tons per cubic mile" and government action waited until health effects were apparent, but the lag time between the science and policy remains.[21] It is humbling personally to have read scientific journals and heard undergraduate professors talk in the 1970's about the chronic ozone exposure phenomenon and the need to change the short-term standard, only to be involved with implementing a standard thirty years later. Hence, we appreciate why EPA appears "gun shy" in setting a new NAAQS. Nonetheless, Americans rely on EPA to keep a steely eye focus on the science, and act boldly to speak truth to power, rather than preemptively surrendering to the almost inevitable litigation against its actions.

We believe it is important to view the revised ozone NAAQS in the context of decades of fine-tuning. The 1-hour ozone standard was first established in 1970, with an attainment date of 1977. After states failed to meet it the attainment date was changed to 1987. When states again failed to meet the standard, the CAA was strengthened in 1990, which proscribed more explicitly what non-attainment areas must do (e.g., lower major source thresholds, RACT, RFP, conformity, etc.). It also set an attainment date for Delaware of 2005 (extreme non-attainment areas were later). Delaware achieved this goal of meeting the 1-hour ozone standard. Although, as described above, EPA first promulgated the 8-hour standard in 1997, litigation delayed designations until 2004, and Delaware's attainment date was established as 2009. We anticipate meeting this attainment date for the current 8-hour standard. So, our message to EPA is simple; set a standard based on solid science, give us the tools, and work with us collaboratively to get the job done.

EPA proposal also appears not to accept CASAC's recommendation about the need for a distinct secondary ozone standard. Ozone also adversely affects trees, crops (soybeans are a particularly sensitive species), and other vegetation. EPA has abundant evidence in 1996 for a strong secondary standard to help avoid the national agricultural loss from ozone pollution estimated to be several billion dollars annually.[22] For a secondary standard (for welfare protection), EPA proposes two options: (1) setting up a new form of standard which focuses on the highest exposure level during plant and vegetation growing season; and (2) setting the secondary standard identical to the proposed primary standard. Hence, EPA leaves open the door on this issue, and we hope its final rule accept this long-accepted scientific data on the need for a protective secondary standard. Delaware remains largely agricultural in is southern counties, and these farmer are also our friends and neighbors. We know that making a living as a farmer is already too difficult without the extra burden of crop losses due to air pollution.

There are two primary reasons why EPA's failure to follow its scientific advisory committee is troubling for a regulator. First, when EPA sets a NAAQS, it is like a "north star" used for navigating by more than 200 states and territories and major metropolitan areas across the United States who have a significant role in regulating air pollution.[23] We chart our course toward this common[24] NAAQS goal according to State Implementation Plans (SIPs) as we promulgate regulations, write permits, perform inspections, and conduct enforcement. It is at this stage in the

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[19]Whitman v. American Trucking Associations, 531 U.S. 457, 464, 475–476)

[20]American Lung Association v. Whitman (No. 1:03CV00778, D.D.C. 2003).

[21]Bachman, John, "Will The Circle be Unbroken: A History of U.S. National Ambient Air Quality Standards," Journal of Air and Waste Management Association, Vol. 57, p652, June 2007.

[22](61 FR 65742, December 13, 1996, National Ambient Air Quality Standards for Ozone: Proposed Decision An examination of the monetized benefits reported above indicates that most of the estimated benefits accrue from attainment of the 8-hour, 0.08 ppm primary standard with a smaller incremental improvement obtained by the addition of a seasonal secondary standard. The projected national approximations for commodity crops and fruits and vegetables suggest that benefits on the order of 1 to more than 2 billion dollars would result from the proposed 8-hour, 0.08 ppm primary standard, alone or in combination with a seasonal secondary standard.

[23]The National Association of Clean Air Agencies generally represents air pollution control agencies. See http://www.4cleanair.org/

[24]California has adopted an ambient 1-hour ozone standard of 0.09 ppm, and an 8-hour standard of 0.070 ppm. Cal. Reg. Notice Reg. 2006, Vol. 17-Z, April 28, 2006, at http://www.oal.ca.gov/pdfs/notice/17z–2006.pdf; or http://www.arb.ca.gov/research/aaqs/ozone-rs/ozone-rs.htm, and 17 CCR 70100.

process that we consider cost-effectiveness, not during the standard setting stage. We routinely look carefully at the costs and benefits of various options in an endless complex web of issues, including tradeoffs of time, money, State priorities and staff resources. We need to know that when we attain the NAAQS, it reflects a goal that is protective, based on the best available science. This is something worth working toward. If EPA flinches from its role is setting a NAAQS based on anything less than the best scientific advice, it is like someone putting a prism in our sextants throwing off the navigation of hundreds of regulatory ships.

Second, EPA's failure to propose a standard consistent with the CASAC recommendation tends to undermine environmental professionals everywhere who take pride in operating as much as possible on a science-based approach to problem solving.

Finally, the Committee may wish to examine EPA's broader NAAQS-setting process, which has reportedly changed to eliminate use of staff papers and to instead use risk assessments and Advanced Notices of Proposed Rulemaking. It is not clear what the ultimate impact of this fundamental process change will have, but I recognize it results from weighing the best ways to assess the science, given factors such as the need for reviews every 5 years, and the lack of a clear health effect threshold.

2. An Increased Number of Non-Attainment Areas is Appropriate and Universally Helpful Toward Improved Air Quality

One of the concerns expressed about EPA's proposed ozone standard is the increased number of non-attainment areas that would be created. Obviously, if the air quality in certain areas—typically bordering current non-attainment areas—fails to meet the new NAAQS, then they should properly be classified as non-attainment. The result of these new non-attainment designations will obviously be more stringent air pollution control requirements and larger offsets.

These additional pollution reduction measures are appropriate not only to protect public health in those new non-attainment areas, but will also help improve air quality in adjacent areas that were previously non-attainment. Significant upwind sources located in attainment areas, continue to enjoy less stringent control requirements than downwind non-attainment areas, even though part of the cause of the downwind non-attainment problems is the upwind sources. For example, if a new cement plant were to be constructed 100 yards inside the border of a county designated as attaining NAAQS, it would enjoy far less stringent air pollution control requirements, even though the top of the smokestack would likely be located in the adjacent non-attainment county if it were to fall over in the right direction. A State agency would have difficulty imposing controls on such a plant in order to protect an adjacent downwind county that is the victim of the new emissions source. This inequity could be rectified by designating this host county as "non-attainment."

We understand there is some concern with the prospect of adopting a new scientific standard for human health protection, when the implementation of the previous health standard has barely begun. For environmental engineers and scientists, however, this "pipeline" of standards and implementation is part of the normal process of careful development of programs to protect human health, and of the perils of litigation that affect these programs. Accordingly, we believe that a protective ozone NAAQS—certainly no less stringent than proposed by EPA—should be adopted with all due alacrity so that the public benefits can be realized through detailed implementation. Based on the proposal we anticipate the following timeline:

- 2009, States make recommendations for areas to be designated attainment and non-attainment,
- 2010, EPA makes final designations,
- 2013, State Implementation Plans outlining how states will reduce pollution to meet the standards will be due, and
- 2013 to 2030, attainment will be required depending on the severity of the problem.

3. Meeting the Ozone NAAQS Requires Support, Not Cuts, to State and Local Programs

Obviously, further reduction in ozone precursor emissions will be necessary to attain and maintain compliance with any new, more stringent ozone NAAQS. A reduction in emissions will involve the development of control programs, and consultation with other States, the EPA, the OTC, etc; and such activates will take funding. Continued cuts of EPA air grants, like the CAA 105 grant, will set us up to fail. Delaware's 2008 CAA 105 grant is about 15 percent below the level it was in 2004, and this reduction occurred at a time when State rules and SIPs were being developed

to meet the 1997 ozone and fine particulate matter standards. This trend cannot continue. Development, and implementation and enforcement of new control programs take resources, and the cost of these resources is minimal compared to the value of the benefit of clean air.

We have worked through the Environmental Council of States (ECOS) and other organizations to try to reverse these damaging budget cuts. In a June 2006 letter to EPA, ECOS included "State and Local Air Quality Management" categorical grants among a limited number of "Higher Priority Programs."[25] Despite this explicit recommendation, EPA's fiscal year budget included additional cuts to our air grant funding. These cuts follow several years of damaging budget cuts and occur at a time when the workload on states to meet tighter NAAQS has increased. Overall, State and Tribal Assistance Grants comprised nearly half of EPA's overall budget (94 percent in 2004), but have received 94 and 100 percent of the cuts in 2005 and 2006, respectively.[26] Clearly, these cuts are disproportionate, and we believe should be reversed. States continue to implement the nation's core environmental programs. These cuts have hit home hard in Delaware: our air quality management grants from EPA have been cut 10 percent for 3 years—every year since 2004 (FY 2007 grants has not yet been determined). These compounded cuts have caused an overall 15 percent reduction in our Federal air quality management funding from EPA since 2004 (assuming 3 percent inflation).

States in fact conduct most of the permitting, enforcement, inspections, monitoring and date collection required by Federal law. All of this work is performed through funding Congress provides to states through EPA's budget. Without adequate funding meeting existing NAAQS, much less revised NAAQS will be more difficult a concern voiced articulately by Michigan Governor Granholm; "If you truly want Clean Air to be more than just a good idea you will restore the fiscal year funding cuts and fully invest in State air offices."[27]

Contrary to EPA's verbal commitments to continued partnership, EPA's recent rescission package included a shift from air quality to underground storage tanks funding. We recognize the need to provide funding to address this unfunded Federal mandate or increase inspection frequency as mandated by the Energy Policy Act, but we do not agree that this funding should be provided at the expense of another critical State program grant.

4. AIR POLLUTION COSTS AND BENEFITS: DEJA VU ALL OVER AGAIN

Recent reports[28] of the costs, technical challenges and complexity of meeting Clean Air Act attainment deadlines remind me of the observation of baseball great and philosopher, Yogi Berra, "It's Deja Vu all over again." Regrettably, much of the analysis behind these claims has not been subject to the normal peer review process for publication in a scientific journal. More substantively, it fails entirely to consider the substantial benefits of emission reductions and examines only the projected costs. Finally, the complexity of the Clean Air Act is nothing new to those of us who live in this world of air pollution control. We are more sympathetic than most to the desire for simplification. The essential management metric for evaluating the performance of any proposal is the impact on air quality. And by this measure, we cannot support trading off paperwork simplification for dirtier air in the real world. We urge the Committee not to confuse "harmonizing" dates with merely "kicking the can down the road" on improving the air quality and achieving the sustainable health benefits known to be possible.

These "cost-only" studies also have had a strong track record of overstating the eventual costs, whether it was the original acid rain studies or the more recent estimates of New Source Review (NSR) compliance. And on this matter we must also disagree: we do not agree that American engineers lack the skill and creativity to develop innovative technologies and methods for achieving air pollution reductions more cost-effectively than merely extrapolating from current trends. We also stand ready to continue to pursue regulatory streamlining that reduces compliance costs

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[25]Hallock, Stephanie, Environmental Council of States President and Director of Oregon DEQ, Letter to Lyons Gray, EPA Chief Financial Officer, June 20, 2006. http://www.ecos.org/files/2177—file—Letter—to—Lyons—Gray—on—2008—STAG—Budget—Priorities.pdf

[26]Environmental Council of States, "The States' Proposal to Congress for EPA's 2008 STAG Budget (State and Tribal Assistance Grants Budget); An Alternative to US EPA's 2008 Budget proposal Supported by the States' Environmental Agencies", February 2008.

[27]Granholm, Jennifer (Governor of Michigan), Letter to EPA Administrator Stephen Johnson, April 10, 2007 [restore the fiscal year funding cuts and invest in State air offices]

[28]For example, NERA Economic Consulting for the American Petroleum Institute, Economic Impact of 8-Hour Ozone Attainment Deadlines on Philadelphia Region, September 2005 (released November 7, 2005).

(e.g., paperwork and permitting value stream mapping). In short, we are very bullish on American ingenuity, and have been richly rewarded for our confidence in the past.

We are not insensitive to costs. We live in the communities where our neighbors' jobs are on the line. We cannot, however, ignore the substantial and subsequent savings derived from health-related costs from air pollution. So, the question is not whether there are costs, but rather "who bears the costs?" There are clear, though less quantifiable, costs to public health that result from failing to address air pollution problems. In conjunction with our State Division of Public Health, Delaware recently released a report on "the Asthma Burden",[29] which showed a continuing increase in the number of asthma cases. We realize these asthma cases cannot be attributed solely to air pollution. However, this report provides local data supporting hundreds of other studies finding a rising tide of asthma that represents a terrible burden on individuals, families, communities, employers and the economy. So, when you hear calls to adjust current schedules for compliance, we urge you to consider the other side of the cost formula; the health benefits and subsequent savings derived from controlling air pollution promptly.

We realize there are those who argue that health standards should be subject to strict cost-benefit analysis. We respectfully disagree with this view. Fortunately, this is not a question we need before us, because of both the science and the law. Over the years, every major, peer-reviewed study has found substantially greater benefits than costs from controlling air pollution, and found greater benefits from air pollution control than virtually any other environmental programs (e.g., oil spill cleanup). Among the most prominent studies was EPA's "unfinished business report, release in 1987, which found air pollution to be among the highest benefit program in EPA.[30] A few years later, under President George H.W. Bush, EPA's Science Advisory Board reviewed this assessment more rigorously and found uncertainty in the estimates for many areas, except air pollution control.[31] Criteria Air pollutants were ranked as a high risk by the unfinished Business report in the 1980's. In 1990 the Science Advisory Board report on Reducing Risk "considered to be supported more firmly by the available data than were the rankings for the others." More recently, in 2003, the White House Office of Management and Budget, Office of Information and Regulatory Affairs, under John Graham, found air pollution control to be one of the clearest examples of an environmental program producing benefits outweighing costs.

We fully realize there is a substantial cost to complying with the air pollution control requirements necessary to meet these new standards. We also realize there is a cost to not complying with these standards. These costs are the often ignored benefits of attaining healthful air quality. We realize the real benefits of controlling $PM_{2.5}$ pollution is difficult to quantify and that estimates vary significantly from local epidemiological estimates on one end of the spectrum to the John Locke institute on the other end. We refer you to EPA's estimate of the health benefits, described in the recent implementation rule for fine particulates[32], which, of course could not have been published without approval by the White House Office of Management and Budget's Office of Information and Regulatory Affairs. And the evidence of serious health problems from particulates continues to mount a recent survey of data from 90 urban areas.[33] Again, we do not suggest cost be ignored, but strongly urge that the benefits be weighed as well.

C. COLLECTIVE EFFORT BY STATES, EPA AND INDUSTRY HAS YIELDED REAL PROGRESS IN AIR QUALITY

All states, in cooperation with the EPA and industry, have made significant strides in improving the quality of the air in recent decades. We have also advanced

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[29]The Burden of Asthma in Delaware, Delaware Health & Social Services Division of Public Health, and Department of Natural Resources and Environmental Control, August 2005.

[30]EPA, Unfinished Business: A Comparative Assessment of Environmental Problems, 1987.

[31]EPA, Reducing Risk: Setting Priorities and Strategies for Environmental Protection, SAB-EC—21, September 1990. and Stevens, William K., "What Really Threatens the Environment", New York Times, January 29, 1991.

[32]Proposed Rule To Implement the Fine Particle National Ambient Air Quality Standards; Proposed Rule 70 Fed. Reg. (210) 65984–66067, November 1, 2005.

[33]JAMA study Pope CA 3d, Burnett RT, Thun MJ, et al., "Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution," Journal of the American Medical Association (JAMA), 2002;287:1132–1141; Brook RD, Brook JR, Urch B, et al. Inhalation of fine particulate air pollution and ozone causes acute arterial vasoconstriction in healthy adults. Circulation. 2002;105:1534–1536; and Ozone and Short-term Mortality in 95 U.S. Urban Communities Bell, M.L., et al. (2004). JAMA 292, p. 2372–2378.

our collective understanding of what forms of control offer the most effective path to success, both from ease of implementation and from an economic view. We have managed to improve air quality by reducing emissions while enjoying increases in GDP and experiencing significant growth in vehicle miles traveled. Since 1970, we have cut emissions that cause soot, smog and acid rain by more than half, even while our nation's economy has grown by 187 percent—clear evidence that a growing economy and environmental results can, in fact, go hand-in-hand.[34]

The CAA established a clear path to ameliorate these problems, and it has worked. The Act provides the states with the mechanism to accomplish this task by identifying the culprit areas and identifying sources within the areas most likely to be causing the problem. Areas designated nonattainment have 3 years to develop State Implementation Plans (SIPS), the most recent of which was recently submitted to EPA to meet our June 2007 8-hour ozone SIP deadline. The preparation and adoption of past SIPs by each State containing a nonattainment area are grueling tasks, but with very limited exceptions, and only in extraordinary circumstances, have these SIPs not been submitted by the appointed date. A combination of detailed information on the amount of air pollution entering the state, plus information on the amount of pollution generated internally, constitute the cornerstone of the SIP preparation. Knowing how serious the pollution problem is, and what is causing the problem, states can perform complex modeling to determine how much reductions in emissions are necessary to result in an attainment condition. Determining the necessary control measures to achieve that reduction in emissions, whether locally or regionally, is the final major step in the process. When regional emissions are the major contributor, regional solutions must be developed. One example of this activity is the exemplary work accomplished by the Northeast Ozone Transport Commission (OTC), including all states from Maine to Virginia, working together for a common cause. Using the mechanisms of MOUs and Resolutions, members of the OTC work together to develop control measures that benefit wide areas and not strictly one State.

It is EPA's responsibility and authority to require the preparation of SIPs as expeditiously as possible, and provide adequate support by developing guidance documents, in a timely manner, which states can use to move forward with their work on the SIPs. This mandate, as clearly defined in the Clean Air Act, forms the backbone for the important relationship between the Federal, State and local governments, and allows the entire process to move forward effectively and efficiently. For example, under the ozone and fine particle standard implementation rule, it is the clear responsibility for the Federal Government to promulgate rules on utilities and other large sources, mobile sources, ports, rail operations and others, that produce a universally positive impact on reducing emissions. Subsequent to that activity, and depending on how severe a nonattainment condition remains, State and local areas must fill in the gap with more localized measures that are not pre-empted by Federal authority.

Thanks largely to the tools provided in the 1990 Clean Air Act Amendments, the number of days when air quality exceeded the ozone NAAQS has dropped significantly since 1990. On this hot day in July, which is typically a time of year when ozone pollution is at it worse, we need to be aware of the effect of the combination of high temperatures, abundant sunshine and extra ozone precursors (NO_x and VOC_s) emitted from coal-and oil-fired power plants supplying power to the grid, which create a recipe for high ozone levels. The good news is that for several years, the average peak concentrations of ozone have declined based on data from Maryland, which is fairly typical for an eastern state. So, while today's air quality is a "Code Orange" (Unhealthy for Sensitive Groups) here in Washington and other eastern metropolitan areas, there is better chance of healthful air quality than 10 years ago, thanks to a variety of controls. For example, more than 170 Selective Catalytic Reduction (SCR) NO_x control units have been installed from 2001 to 2005, and more than 50 percent of the coal fired capacity in five important states (IN, OH, KY, TN, and WV) have SCR. What is amazing is the current projection that many of us thought would be impossible only a few years ago: all of the major metropolitan areas in the OTC are now projected to meet 8-hour ozone standard—Washington, DC, Boston, Philadelphia, Baltimore, and, hopefully, New York/ Connecticut.[35]

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[34]EPA Administrator Stephen Johnson speech at Adirondack Council 30th Anniversary, Essex, NY, August 4, 2005.

[35]Aburn, George (Tad), Maryland Department of the Environment, Air Director, (Ozone Transport Commission Summary), Improving Air Quality Through Regional Action: Presentation to OTC Annual Meeting, June 2007. Available at http://www.otcair.org/document.asp?Fview=meeting#

This forum does not allow for a full description of the various controls that have contributed to this improvement in air quality, but I would like to list just some of the measures Delaware has adopted or are in the process of adopting, in coordination with other OTC states, most of which are not specifically identified in the CAA:

1. Architectural and Industrial Maintenance (AIM) Coatings: reduced VOC content of numerous coatings beyond Federal requirements.
2. Mobile Equipment: established coating equipment standards to reduce VO_c emissions.
3. Gas Cans: required gas cans meet certain performance and permeability standards to reduce VO_c emissions.
4. Degreasing: reduced degreaser vapor pressure and instated equipment standards and work practices to reduce VO_c emissions.
5. Control of NO_x Emissions from Large Boilers: reduced NO_x emissions from boilers larger than 100 mmbtu/hr that weren't well controlled through other programs.
6. Anti-Idling: reduced VO_c, NO_x, SO_x, and DPM emissions from heavy duty vehicles by reducing allowable idling time.
7. Open Burning: instated strict open burning ban during the ozone season.
8. Minor NSR: reduced criteria pollutant and air toxic emissions by subjecting new minor stationary sources to top-down BACT requirements.
9. OTC NOX Budget Program: participated in a regional NO_x Cap and Trade program to reduce NO_x emissions from power plants (program later replaced by the NO_x SIP Call).
10. Adopted several regulations to reinforce EPA-adopted heavy-duty diesel rules.
11. Stationary Generator Regulation: will reduce criteria pollutant and carbon dioxide emissions from stationary generators.
12. Peaking Units: will reduce peak ozone day NO_x emissions from combustion turbines used as electrical peaking units.
13. Refinery Boilers: will reduce NO_x emissions from large refinery boilers.
14. Non-Refinery Boilers: will reduce NO_x emissions from large non-refinery boilers.
15. Utilities Multi-P: will reduce NO_x, SO_x, and Hg emissions from Delaware's coal and residual oil fired electric utilities.
16. Lightering: will reduce VO_c emissions from crude oil lightering operations in the Delaware Bay.

The point is that there is no "silver bullet" solution, but a variety of individual actions that yield success. We weigh each of these control measures carefully to seek the most cost effective measures to meet our air quality goals in a way that makes sense for our state. This is where the various cost-effectiveness issues are appropriately considered, not in setting the NAAQS.

D. More Work is Needed to Meet Air Quality Goals

Notwithstanding this progress, largely through State efforts, air pollution control cries out for a complementary strong Federal role over interState activity. The primary EPA response to this need for a stronger Federal role is the Clean Air Inter-State Rule (CAIR)[36], which was an important step toward addressing the age-old problem long known to those of us in the dismal science of air pollution: the wind obeys no State boundaries.

We have worked with other Ozone Transport Commission (OTC) states to evaluate CAIR and found it does not adequately reduce emissions to levels needed to reach attainment of lower ozone and PM standards in the northeast and mid-Atlantic States. EPA acknowledged that there would be "residual" non-attainment areas after full implementation of CAIR, but detailed modeling suggests strongly that the difference between EPA's coarse scale modeling and that which was done by the OTC shows there was a larger gap to fill. Relative to the current ozone and fine particulate matter standards we believe we have bridged this gap left by the CAIR rule. However, a gap between the where we are now, and the new ozone and fine particulate matter standards still exists. The kinds of improvements on the original CAIR framework include nonroad emission control and fuel requirements, and the tightening of the existing controls on stationary sources. Another example of measures directed to improve upon the CAIR framework are being accomplished under the auspices of other regional organizations in the Midwest and the Southeast.

EPA's adoption of the CAIR rule is clearly a universally effective first step, but it only a first step. While EPA has taken an important first step to address transport, we are still concerned that the agency has not done enough, and more must be done to address these new, more stringent health based standards. Additionally, we are troubled by EPA effort to weaken an important regulatory tool under Section

[36] 70 Fed. Reg. 25162 (May 12, 2005); 40 CFR 51.

126 of the Clean Air Act for addressing interState transport, and actions such as preemption of State authority on small engine controls, accomplished by legislated activity and prevention of State's ability to adopt mobile source rules identical to those of California, severely hamper a state's ability to do its job. Very simply put, if a State is able to pass muster through its normal adoption process, which is both very open and rigorous, there is no reason to prevent a State from doing so.

Delaware has been working for more than 30 years to reduce ozone concentrations. We have controlled all large sources of emissions that contribute to the ozone problem far beyond the minimum Federal requirements. We have controlled all our major VO_c and NO_x sources with reasonably available control technology (RACT). We have gone beyond RACT, and further controlled Delaware-unique sources like Lightering; sources that are large on a regional and national basis like consumer products and paints; and sources where the EPA did not go far enough, like regulations covering power plants.

We have done a lot to reduce ozone concentrations, and it shows in our air quality. Delaware has attained compliance with the previous 1-hour ozone NAAQS, and have recently demonstrated that we will attain compliance with the current 8-hour NAAQS by 2010. We know what it takes to reduce ozone concentrations, and we will do more, however we also know that we, ourselves, cannot reduce ozone concentrations much more. The implementation process associated with any new, tighter ozone NAAQS must recognize this, and a key to that recognition is how non-attainment area boundaries are established. It is this area that we need EPA and legislative support.

In the past the EPA has concentrated on Metropolitan Statistical Area or Consolidated Metropolitan Statistical Area (C/MSA) associations as the presumptive NAAQS non-attainment area boundary. Delaware believes that continuing this practice will not be successful under a tighter ozone NAAQS. Reasons for this belief include:

• The C/MSA approach is based on census data rather than airshed analysis data. Census data, in comparison to airshed analysis data, represents a poor surrogate for determining non-attainment boundaries.

• Detailed regional airshed studies have been completed, such as the Regional Oxidant Modeling (ROM) project covering most of the Ozone Transport Region (OTR) states, the Ozone Transport Assessment Group (OTAG) project and the NOX SIP Call analysis covering most of the Eastern U.S. These studies have demonstrated that the ozone problem is transport-driven and regional in scope, rather than localized or confined to relatively small C/MSA's. These studies have further demonstrated that individual C/MSA's have minimal control over their ability to demonstrate or achieve attainment. Delaware believes that this conclusion should become the cornerstone of good air quality planning and policy, starting with the crucial boundary determinations.

• In many areas, including Delaware, the air coming into a county is often with ozone concentration greater than the current 85 ppb ozone NAAQS, so under the C/MSA approach such an area may be required to solve a problem that is not possible to solve under its own authority. This will likely be more of a factor under a tighter ozone NAAQS. Should the EPA continue to fail to address transport completely and in a timely manner, this could lead to a need to install ineffective and costly controls, sanctions under the CAA, and likely delay protecting public health in those areas.

• The C/MSA-based approach has had, at best, minimal success toward achieving attainment of the prior 1-hour and the current 8-hour NAAQS. From Delaware's experience, most of the success on the east coast to date is attributable to national measures taken by the EPA, and regional measures developed and adopted by the Ozone Transport Commission (OTC) member states. Given that 8-hour non-attainment under any new, tighter NAAQS would be more regional in nature than the current 8-hour non-attainment, a C/MSA-based approach is not appropriate.

Delaware believes that the EPA must designate non-attainment area boundaries consistent with the regional nature of the problem. Delaware believes that one way of doing this is by designating as a single non-attainment area, within an area that is as regional as possible, all counties that are "non-attainment" with the 8-hour ozone NAAQS. Practically speaking, this recommendation would likely establish a single non-attainment area that encompasses all counties that are monitoring non-attainment, or that are part of a non-attainment CMSA, within the NO_x SIP Call domain.

Delaware believes that a regional approach would:

• Include in the non-attainment area all or most of the counties necessary to solve this regional problem. It will give all involved a vested interest in solving this

regional problem. It will also foster cooperative development and implementation of control strategies that will best serve the designated areas.

• Remove political barriers, and level the playing field by setting the consistent, proven baseline control requirements of Subpart 2 of Title I, Part D of the CAA within the region, which include New Source Review (NSR), vehicle Inspection and Maintenance, and Reasonably Available Control Technology (RACT) requirements.

• Compliment national and regional rules that address regional transport.

• Recognize that ozone non-attainment is a "regional problem" and not a "local problem with a transport component," and that it is necessary to go beyond the C/MSA approach that has largely failed for nearly three decades under the 1-hour ozone NAAQS.

• Simplify and provide equity to the process of implementing the 8-hour NAAQS. In short, demonstrate that we have learned that a continuation of the existing process does not work.

Delaware fully acknowledges that the progress we have made to date in the control of ozone has only been possible because of the collaborative process between EPA and the states. EPA's continuing efforts to establish stringent Federal mobile source emission standards, develop improved modeling and other analytical techniques, and develop policies that facilitate the development and implementation of large-scale attainment strategies are greatly appreciated. An intensified level of effort will be imperative to our continued success. I hope that EPA will be open to policy changes that will support the technically sound and equitable ozone attainment process being recommended here by Delaware.

In addition to continued near-term implementation of these measures, a whole new set of air pollution controls will likely required in the long term. Beyond using "end-of the pipe" controls, and "command and control systems," we know that fundamentally different approaches will be needed if we are to meet our long-term air quality goals. For example, much more investment into energy efficiency is needed. Also, a much stronger and serious coordination on land use goals to help prevent suburban sprawl, which leaves generations of citizens with no realistic option but the use of their private automobiles for transportation. After decades of unbridled sprawl, it is virtually impossible to superimpose a mass-transit system on top of land-use patterns designed for cars, much less encourage more walkable and livable communities among car-friendly development patterns. I was proud to attend the recent celebration of the completion of the Wilmington and Western Railroad in Hockessin, Delaware, and hear our home State Senator Tom Carper speak. He used the opportunity to make the point that trains are not merely part of the past, but will be part of our future as well; and that we must meet the challenge of reducing our oil dependency, which results in sending money overseas to a part of the world where people want to harm us. My 10-year old son, said, "Dad, he sounds like you." I told him, "No, Nicolai; maybe I sound like him." I greatly appreciate your leadership on these issues, Mr. Chairman.

Thank you for the opportunity to present these views. I would be happy to answer your questions.

Senator CARPER. Thank you. Thank you for an excellent statement.

Now we will hear from Vickie Patton, who is Deputy General Counsel of Environmental Defense. She was introduced to me as one of five people in the United States who actually understands the Clean Air Act. I suspect one or two more who understand it are in this room. But that is a high commendation, and I am glad somebody does. I am glad that I have you around to explain some of it to us from time to time. Thank you for being here today. You are recognized for 5 minutes.

STATEMENT OF VICKIE PATTON, DEPUTY GENERAL COUNSEL, ENVIRONMENTAL DEFENSE

Ms. PATTON. Thank you very much, Senator Carper, Senator Boxer, Senator Voinovich, for the opportunity to be here today.

I have spent about 16 years of my career working on clean air issues. First, in the Environmental Protection Agency's Office of General Counsel, where I served in the first Bush administration

and then in the Clinton administration as a staff attorney, and then working at Environmental Defense, a non-partisan, non-profit science-based environmental advocacy organization.

I would like to just build on some of the comments that you all have made. Several of you have commented on the recommendations of EPA's Clean Air Scientific Advisory Committee. There was, in fact, something remarkable happened on October 4th of 2006, when that Clean Air Scientific Advisory Committee gave its recommendations to the Administrator of EPA.

There are several aspects of this letter that are quite striking. The first is the force and the clarity of the recommendations. What they said to the Administrator of EPA is that there is no scientific justification for retaining the current health standard, no scientific justification. Those are very strong words from the Nation's leading scientists.

Second, they said that the current standard should be substantially reduced. Not only did they say that it should be substantially reduced, but they said, based on this body of science before us, the appropriate range of protection is between 06 and .07.

Then they went on to say that really, not only are these the views of the individual members of the CASAC, but these are the views of this 23 member body that includes the Nation's leading epidemiologists, toxicologists, doctors. Not only does it reflect their views, but what it reflected is really the culmination of one of the most powerful processes we have in our system of government for integrating science into public policy. And that is this process under the Clean Air Act whereby we look at this amalgam of really tremendous scientific evidence and integrate it into this really important system of laws to protect human health and the environment.

What they said is that the nature of the evidence here is really compelling, because it is not just that we have multi-city and single city epidemiological studies, we do, and it is not just that we have human exposure studies where citizens, oftentimes healthy college students, voluntarily submit themselves to exposures in chambers where scientists look at how they respond to different levels of ozone. They measure how their body reacts. We do.

But we also have toxicological evidence, epidemiological evidence, human exposure studies, toxicological evidence, this really broad nature of evidence that tells us that we need to do better to protect human health. But we also have compelling evidence about the range of effects that are observed. We know that there are increased school absences on high ozone days. We know that there are increased emergency room visits. We know that there is increased use of medication as Americans struggle to try to manage constricted chest symptoms on an unhealthy ozone day. And we know that there is premature death because of the research of people like Professor Bell, who is with us today.

So there are a range of different pieces of evidence indicating that there are a broad suite of effects across the population. And indeed, that population reaches quite broadly. The CASAC letter said that it includes children, because their lungs are developing. The CASAC letter said that the population at risk includes people who are active. If you are, for example, a United States Senator

who enjoys running half marathons, you are at risk on high ozone days. If you are above the age of 65, you are at risk on high ozone days. And if you are an American that suffers from any kind of respiratory ailment, you are susceptible to serious risk on high ozone days.

So it was this body of evidence that these tremendous respected scientists reviewed in making their recommendation to EPA. I would just say quickly that is in contrast with what happened here in this rulemaking proceeding in a Washington minute, when in the final stages of the rulemaking process, on June 20th, the day that EPA was entrusted with making this decision, there was a fax sent over from the Office of Management and Budget that altered the strength of this body of scientific evidence and was incorporated into this rule. And it suggests that the Administrator is under tremendous headwinds in making a decision that is truly requisite to protect public health based on an adequate margin of safety.

Thank you.

[The prepared statement of Ms. Patton follows:]

STATEMENT OF VICKIE PATTON, DEPUTY GENERAL COUNSEL, ENVIRONMENTAL DEFENSE

Thank you very much, Mr. Chairman and members of the subcommittee, for the opportunity to testify about the U.S. Environmental Protection Agency's proposed revisions to the nation's health-based ambient air quality standard for ground-level ozone.

My name is Vickie Patton. I am the Deputy General Counsel at Environmental Defense, a national non-partisan science-based environmental organization, where I manage national and regional air quality programs. I previously served as an attorney in the U.S. Environmental Protection Agency's Office of General Counsel under the George H.W. Bush and William Clinton administrations where I worked on a variety of Clean Air Act matters.

BIPARTISAN SUPPORT, EXTRAORDINARY ACHIEVEMENTS

The Clean Air Act is one of the nation's single most effective environmental statutes. Since its adoption in 1970, it has been a triumph of bipartisanship and healthier air.

Senator John Sherman Cooper, a Republican from Kentucky, captured the spirit of bipartisan cooperation that led to the U.S. Senate's historic—and unanimous—adoption of the Clean Air Act in 1970:

We worked together. We disagreed. We worried about many provisions of the bill. At last, however, we joined unanimously in recommending and sponsoring this bill,believing that our approach was one that could make progress toward the solution of the problem of air pollution.

Senator Cooper was wise in his predictions.

The unanimous will of the U.S. Senate has secured healthier air for millions of Americans. The 1970 Clean Air Act embodies the great promise of the American system of law-making in practice. People of good will translated studious research and bold aspirations to writing, and changed history forever.

Through its judicious words, the 1970 Senate saved numerous lives and prevented countless illnesses. The bipartisan founders of the Clean Air Act enabled millions of children to realize their potential unencumbered by neurotoxic lead pollution, and for children across the land to share their precious childhood dreams with grandparents whose lives have been prolonged by reductions in air pollution.

THE CLEAN AIR ACT'S TWO-STEP PROCESS

Congress in 1970 established an effective process in the fight against air pollution. Congress commanded that the national ambient air quality standards be based on public health considerations alone. Then, economics are thoroughly considered in devising the air pollution control strategies to achieve the health standards. So the

law is sharply focused in ensuring the nation's health-standards are established solely on the basis of public health, and this same law is broadly encompassing in considering economics when Federal, State and local officials determine how to cost-effectively achieve the health standards.

PUBLIC HEALTH

Some in industry have long protested this carefully calibrated dual system. Some have argued that this two-step inquiry should be conflated rather than distinct, that the nation's health standards should be based on economics and then economics should likewise infuse the policies to achieve the standards. This argument has been thoroughly presented—and resoundingly rejected—over the past 37 years.

This question was answered by a unanimous Senate in 1970. The language crafted by Congress in 1970 is straight forward; its meaning is plain. The Administrator is instructed to establish standards that "are requisite to protect the public health" with "an adequate margin of safety."[1] The statute thus provides for the health-based standards to be based exclusively on public health and to be precautionary in safeguarding against adverse health effects.

This question has also been consistently answered by the decisions of prior EPA Administrators and numerous judicial decisions of the Federal court of appeals in Washington, DC.[2]

Ultimately, this question was emphatically answered by a unanimous Supreme Court. Justice Antonin Scalia, writing for the high Court, explained that the text of the Clean Air Act is clear notwithstanding the copious arguments of industry lawyers: "Were it not for the hundreds of pages of briefing respondents have submitted on the issue, one would have thought it fairly clear that this text does not permit the EPA to consider costs in setting the standards."[3]

Justice Scalia then set forth the inquiry the Administrator must make in establishing the nation's health-based air quality standards on the basis of science:

The EPA, 'based on' the information about health effects contained in the technical 'criteria'documents compiled under §108(a)(2), 42 U.S.C. §7408(a)(2), is to identify the maximum airborne concentration of a pollutant that the public health can tolerate, decrease the concentration to provide an 'adequate' margin of safety, and set the standard at that level. Nowhere are the costs of achieving such a standard made part of that initial calculation.[4]

Accordingly, in setting the health-based air quality standard for ozone, Administrator Johnson must be steadfast—and unwavering—in basing his decision exclusively on what is requisite to protect the public health with an adequate margin of safety.

ECONOMICS

After the standards are established, the Clean Air Act provides a prominent role for consideration of costs in national, State and local decisions about the pollution control strategies deployed to achieve the health standards. EPA is not only empowered to consider costs in setting emission limits for cars, SUVs, trucks, buses, construction equipment, lawnmowers, aircraft, fuels, power plants, and industrial facilities but it is expressly required by law to do so.[5]

States and local governments, in turn, are distinctly responsible for designing the air quality management plans for their communities and entrusted with determining how the cleanup burden is allocated. Justice Scalia succinctly explained that "[i]t is to the States that the Act assigns initial and primary responsibility for deciding what emissions reductions will be required from which sources."[6]

THE RESULTS

In practice, the two-step process forged in 1970 has been integral to the enduring success of the Clean Air Act. By any measure, the achievements under the national ambient air quality standards have been profound.

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[1]Clean Air Act §109(b)(1), 42 U.S.C.§7409(b)(1).

[2]See Lead Industries Assn., Inc. v. EPA, 647 F.2d 1130 (D.C. Cir. 1980); American Lung Assn. v. EPA, 134 F.3d 388 (1998); NRDC v. Administrator, EPA, 902 F.2d 962 (D.C. Cir. 1990), vacated in part on other grounds, NRDC v. EPA, 921 F.2d 326 (D.C. Cir. 1991); American Petroleum Institute v. Costle, 665 F.2d 1176 (D.C. Cir. 1981).

[3]Whitman v. American Trucking Assns., Inc., 531 U.S. 457, 465 (2001).

[4]Id. (emphasis added).

[5]42 U.S.C. §§7521(a), 7547(a), 7545, 7541, and 7411(a).

[6]Whitman v. American Trucking Assns., Inc., 531 U.S. at 470.

Emissions Reductions and Economic Growth

Under this two-step process, America has dramatically reduced the emissions that contribute to the national ambient air quality standards while the economy has grown.

- Lead emissions have been slashed some 98 percent since 1970.
- Volatile organic compounds, which form ground-level ozone and are often comprised of toxic contaminants, have been reduced by over 50 percent since 1970.
- Sulfur dioxide, which transforms into deleterious particulate pollution, has also been cut in half since 1970.
- Nitrogen oxides, which are implicated in the formation of ground-level ozone and particulate pollution, have been lowered nearly one quarter since 1970.

During the period that these remarkable emissions reductions have occurred, gross domestic product has risen some 174 percent.[7]

Summary of pollution levels and economic growth since 1970 Clean Air Act

Indicator	Pollution cuts since 1970	Percent change
Oxides of nitrogen (NO_x)	6.4 million tons annually	23.8% decrease
Volatile organic compounds (VOC)	18.3 million tons annually	54.3% decrease
Particulate matter (PM)	9.1 million tons annually	74.6% decrease
Sulfur dioxide (SO_2)	15.4 million tons annually	49.4% decrease
Lead	0.22 million tons annually	98.5% decrease
Carbon monoxide (CO)	104 million tons annually	52.5% decrease
Gross Domestic Product		174% increase

Restoring Healthy Air in Communities and Neighborhoods

Similarly, communities with pollution concentrations above the national ambient air quality standards have reduced pollution, saved lives, prevented respiratory diseases and made enormous strides in restoring healthy air.

- Carbon Monoxide. In 1971, when the carbon monoxide health standards were established, 53 out of 58 air quality monitors recorded violations. In 2000, only four monitors in the country exceeded the standards.[8] EPA estimates that the average ambient carbon monoxide concentration in 2001 was 62 percent lower than it was in 1982. The 2001 carbon monoxide levels were the lowest recorded in 20 years.[9] Reductions in carbon monoxide pollution have yielded dramatic returns for health and quality of life by preventing thousands of deaths. The Centers for Disease Control and Prevention estimate that approximately 11,700 deaths from accidental, acute exposures to carbon monoxide were avoided between 1968 and 1998 as a result of the strict vehicle emissions standards for carbon monoxide.[10]
- Ozone. In 2004, EPA identified some 126 communities across the Nation with air pollution concentrations above the ozone health standard adopted in 1997. Today, based on preliminary air quality data, EPA estimates that all but 35 of those areas have ozone concentrations that meet that health standard. Since 1980, peak ozone concentrations monitored at some 275 sites across the country have declined by more than 20 percent.[11]These pollution reductions have prevented hospital admissions and school absences for respiratory illnesses, and have saved lives.

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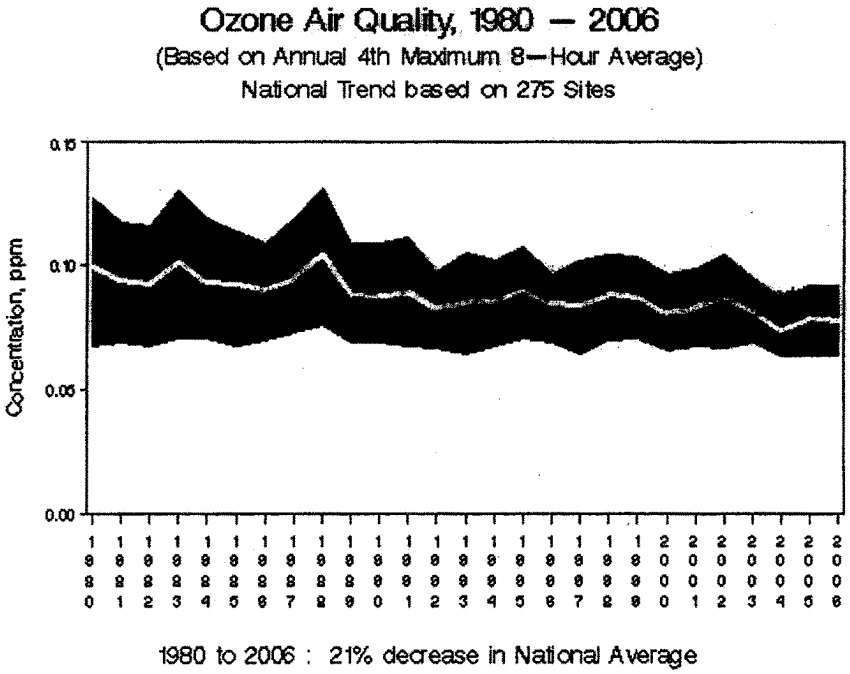
[7]Department of Commerce, Gross Domestic Product (2005).

[8]National Research Council, Committee on Carbon Monoxide Episodes in Meteorological and Topographical Problem Areas. Managing Carbon Monoxide Pollution in Meteorological and Topographical Problem Areas, National Academies Press (2003).

[9]U.S. EPA, "National Air Quality; 2001 Status and Trends" (Sept. 2004).

[10]Mott JA, Wolfe MI, Alverson CJ, Macdonald SC, Bailey CR, Ball LB, Moorman JE, Somers JH, Mannino DM, Redd SC. "National Vehicle Emissions Policies and Practices and Declining US Carbon Monoxide-Related Mortality," JAMA, 299 (2002) 988–995.

[11]U.S. EPA, The Ozone Report, Measuring Progress through 2003, (Nov. 17, 2005).



Health Benefits and Costs

The health benefits secured—each year—due in predominant measure to the national ambient air quality standards under the Clean Air Act are extensive.

• In the late 1970's, nearly every child in America—88.2 percent—had blood lead levels higher than the level of concern established by the Centers for Disease Control and Prevention. By 2000, after the full phase-out of leaded gasoline, 2.2 percent of American children had blood lead levels exceeding the level of concern.[12]

• Each year, the Clean Air Act prevents well over 200,000 premature deaths, more than 650,000 cases of chronic bronchitis, over 200,000 hospital admissions, more than 200 million respiratory ailments, and over 22 million lost work days.[13]

• The monetary benefits to society have outweighed the costs by a factor of more than 40:1.[14]

Technological and Economic Innovation

Technological innovation has made these far-reaching gains in reducing air pollution and protecting public health possible at far less cost than originally anticipated.

• Carbon monoxide is caused by incomplete combustion of gasoline in passenger cars and trucks. Pollution levels were reduced through improved catalytic converters, fuel injection systems and oxygenated fuels.

• In the 1970's, the automakers warned of grave economic consequences if they were required to place catalytic converters in new cars. Today, every car manufactured is equipped with a catalytic control device to reduce tailpipe emissions.

• In 2002, DuPont developed paints and industrial coatings for Daimler Chrysler's coating operation, such as the "Super High Solid" clear coat, that emit few, if any, ozone-forming volatile organic compounds.

• Selective catalytic reduction technologies, deemed infeasible in the early 1990's, are now broadly achieving 90 percent NOx removal from existing coal plants in the East thereby lowering ozone and particulate pollution.

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[12]Centers for Disease Control and Prevention, Executive Summary, Third National Report on Human Exposure to Environmental Chemicals (2005).

[13]U.S. EPA, "The Benefits and Costs of the Clean Air Act, 1970 to 1990," (Oct. 1997)

[14]Id.

• Diesel desulfurization and fluid catalyst cracking technologies have enabled ultra low sulfur diesel fuels and dramatically reduced emissions of particulates, NOx and sulfur dioxide.

• Scrubber technology to remove sulfur dioxide from power plant stack gases is now deployed at a fraction of the costs predicted during the debate over the 1990 Clean Air Act amendments, and wet scrubbers can now achieve 98 percent sulfur dioxide control.

• In 2001, EPA established rigorous particulate pollution emission standards for new diesel trucks and buses, based on the use of catalyzed diesel particulate filters, after a public rulemaking process in which engine manufactures questioned the timing and stringency. Today, new diesel truck and bus engines rolling off the assembly line have dramatically lower particulate pollution.

• In 1994, automobile manufacturers estimated the cost of advanced low emission vehicles would be in excess of $1,500.[15] One year later, Honda placed a Civic subcompact model on the market that emitted less than half of what was permitted under California law, at a cost of $100.[16]

EPA estimates that the suite of innovative technologies, processes and products that have been developed to meet the nation's air quality standards and other Clean Air Act programs have not only delivered extraordinary results but that the nation's pollution control industry has thrived, generating over $200 billion in revenues and supporting more than 3 million jobs.[17]

Telling the Public Whether the Air is Safe to Breathe

The two-step system of air quality management adopted in 1970 ensures that the nation's health standards will be based, exclusively, on health science. This system of air quality management puts the nation's very best scientists at the forefront while provisionally relegating the economists, lobbyists and lawyers to the backburner. Most importantly, however, this system of air quality management provides American families with a transparent and unmitigated science-grounded benchmark for determining whether the air in their neighborhood or community is safe to breathe. And it leaves ample room for the economists and the lawyers and the lobbyists to argue subsequently, in a variety of forums, to what extent society should invest in restoring healthy air.

In sum, the Clean Air Act has been vigorously tested over the past 37 years and it has delivered robust results. Central to its success is the two-part inquiry in which the consideration of costs is not commingled with the establishment of the national ambient air quality standards on the basis of public health. As Justice Scalia explained for a unanimous Supreme Court, conflating costs with public health in setting the standards may altogether eliminate protection against adverse health effects: the consideration of costs "is both so indirectly related to public health and so full of potential for canceling the conclusions drawn from direct health effects."[18]

EPA'S PROPOSED OZONE DECISION

The Administrator, in making his final decision on the ozone NAAQS due March 12, 2008, must establish standards that "are requisite to protect the public health" with "an adequate margin of safety."[19] There are, however, grounds for concern about the direction EPA's final decision will tack notwithstanding this plain statutory mandate and the nation's time tested air quality management system.

Retaining the Current Health Standard is Not Supported by Science and Would Continue to Put Large Numbers of Individuals at Risk

The EPA Clean Air Scientific Advisory Committee unanimously and unambiguously advised EPA Administrator Stephen Johnson: "(1) There is no scientific justification for retaining the current primary 8-hr NAAQS of 0.08 parts per million (ppm), and (2) The primary 8-hr NAAQS needs to be substantially reduced to protect human health, particularly in sensitive subpopulations."[20] The Committee also

[15]Sierra Research, Inc., "The Cost Effectiveness of Further Regulating Mobile Source Emissions," Feb. 28, 1994.

[16]he New York Times, "Honda Meets a Strict Emission Rule," August 30, 1995.

[17]Prepared for EPA by ICF Consulting, The Clean Air Act Amendments: Spurring Innovation and Growth While Cleaning the Air, (Oct. 27, 2005).

[18]Whitman v. American Trucking Assns., Inc., 531 U.S. at 469.

[19]Clean Air Act §109(b)(1), 42 U.S.C.§7409(b)(1).

[20]Dr. Rogene Henderson, Chair, CASAC, to Stephen Johnson, EPA Administrator, "Clean Air Scientific Advisory Committee's (CASAC) Peer Review of the Agency's 2d Draft Ozone Staff Paper," (Oct. 24, 2006).

unanimously agreed upon a recommended range: "Therefore, the CASAC unanimously recommends a range of 0.060 to 0.070 ppm for the primary ozone NAAQS."[21] These recommendations leave no room for misinterpretation.

But EPA has nevertheless expressly held open the prospect of retaining the current health standard for ozone unchanged, and EPA explicitly seeks public comment on such an outcome. The CASAC squarely addressed this matter and pointedly found that "there is no longer significant scientific uncertainty regarding CASAC's conclusion that the current 8-hr primary NAAQS must be lowered" and "[r]etaining this standard would continue to put large numbers of individuals at risk" —

[T]here is no longer significant scientific uncertainty regarding the CASAC's conclusion that the current 8-hr primary NAAQS must be lowered. A large body of data clearly demonstrates adverse human health effects at the current level of the 8-hr primary ozone standard. Retaining this standard would continue to put large numbers of individuals at risk for respiratory effects and/or significant impact on quality of life including asthma exacerbations, emergency room visits, hospital admissions and mortality.[2]

In sum, CASAC unequivocally found that there is no basis in public health considerations for EPA to retain the current standard. EPA nevertheless persists in considering this flawed option.

OMB Instructed EPA to Delete References to Ozone Mortality Benefits in Important Recent Rulemakings Under the Clean Air Act

The scientific evidence of mortality benefits is one of the significant scientific developments since EPA's 1997 decision to lower the ozone health standard. The CASAC expressly pointed to the studies on ozone mortality effects as part of the body of evidence documenting adverse health effects below the current health standard. The CASAC found:

- "Several new single-city studies and large multi-city studies designed specifically to examine the effects of ozone and other pollutants on both morbidity and mortality have provided more evidence for adverse health effects at concentrations lower than the current standard."[23]
- "[A]dverse health effects due to low-concentration exposure to ambient ozone (that is, below the current primary 8-hour NAAQS) found in the broad range of epidemiologic and controlled exposure studies cited above include . . . an increase in mortality (non-accidental, cardiorespiratory deaths) reported at exposure levels well below the current standard."[24]
- "Retaining this [the current] standard would continue to put large numbers of individuals at risk for . . . mortality."[25]

CASAC's series of statements in its October 24, 2006 correspondence to the Administrator placed CASAC's full force, unanimously, on the evidence of mortality and other health effects in compelling EPA to adopt a lower standard to protect public health with an adequate margin of safety. But, only a few moths thereafter, OMB was moving in the opposite direction, instructing EPA staff to remove ozone mortality benefits from major rulemaking initiatives involving reductions in ozone-forming pollution.

Appendix A attached contains three emails between EPA staff and OMB in the context of a draft rulemaking proposal to lower ozone-forming pollutants and other contaminants from diesel locomotives and commercial ships.[26] The first email, dated January 17, 2007, from EPA staff to Mr. David Rostker at OMB, transmits the discussion of ozone mortality that EPA "plan[s] to include in the RIA for the proposed Locomotive and Marine Engine Rule."[27] The EPA staff member further explains that "[m]any Agency staff have contributed to this version, including representatives from OAQPS, OPEI, ORD, and OPAR."[28] On February 22, 2007, EPA staff sends a follow up note to Mr. Rostker at OMB describing the current status of discussions with OMB: "As best we know, the only open issues/comments are ozone mortality and your question about idle reduction."[29] The very next day, EPA staff sends an email to Mr. Rostker, of OMB, now reporting that the discussion of ozone mortality benefits will be removed from the both the preamble to the rule and the draft Regu-

[21]Id. at 2 (italics in original).
[22]Id. at 5 (italics in original).
[23]Id. at 3 (citations omitted).
[24]Id. at 4.
[25]Id. at 5.
[26]The notice of proposed rulemaking was formally published on April 3, 2007, 72 Fed. Reg. 15,938.
[27]EPA Staff Email to David Rostker, OMB (Jan. 17, 2007), Appendix A.
[28]Id.
[29]EPA Staff Email to David Rostker, OMB (Feb. 22, 2007), Appendix A.

latory Impact Analysis: "The text below was written to address the fact that we aren't including ozone benefits (mortality or otherwise) in our analysis. The same paragraph will be included in both the preamble and the RIA. For now, however, I'm pasting it below for your review."[30] The implication is clear. OMB rejected EPA's language analyzing the ozone mortality benefits as part of the basis for an important national rulemaking, and did so only months after CASAC recognized the powerful force of the studies associating ozone and death.

The process repeated itself the very next month. During the development of another important rule, EPA staff responded to an email from Mr. David Rostker at OMB flagging his objections to quantified ozone mortality benefits in the draft Regulatory Impact Analysis. The EPA response to OMB's objection states: "We have removed all references to quantified ozone benefits (including mortality) in the most recent version of the ES."[31] The rulemaking in questions involved proposed new emission standards to limit the ozone-forming pollution from gasoline-powered lawnmowers, handheld garden engines, and marine sterndrive engines.[32]

OMB Transmitted Significant 11th Hour Language Changes to Weaken the Rule That were Incorporated Into EPA's Formal Ozone NAAQS Proposal

EPA was under a court-supervised deadline to issue its proposal regarding the ozone NAAQS by June 20th. The public docket shows that on that day, OMB transmitted a series of inserts to EPA that altered, and materially weakened, the proposal in the following significant respects:

• The first page of the fax from OMB contains excerpts from Justice Breyer's concurring opinion in Whitman v. American Trucking Assns, Inc. OMB presents the language to EPA as the basis for the Agency to avoid the majority opinion of the United States Supreme Court. The explanatory language at the top of the fax states: "EPA could follow the direction of a Supreme Court Justice without fear of contempt, especially if (as OIRA pointed out) the EPA risk assessment finds little health improvement nationwide."[33] Justice Breyer's language was in fact incorporated on pages 11–12 of the final proposal now posted on EPA's website at: http://www.epa.gov/ttn/naaqs/standards/ozone/data/2007—06—o3npr.pdf

• The second page of this same fax from OMB contains language laying out the rationale for EPA to retain the current ozone health standard without changes based on a host of "uncertainties" provided by OMB. This OMB transmitted language, which was incorporated in substantial part in EPA's preamble, reads as follows: "The Administrator recognizes that there is a concern that adopting a more stringent 8-hour standard now, without a better understanding of the health effects associated with O3 exposure at these lower levels, will have an uncertain public health payoff. These questions include uncertainty in (1) the exposure estimates, (2) the estimation of concentration-response associations in epi studies, (3) the potential role of co-pollutants in interpreting the reported associations in these epi studies, and 4) [sic] the effect of background concentrations. In fact, the Agency continues to undertake a substantial research program in an effort to clarify some of these uncertainties. As a result, the Administrator acknowledges the possibility that it would be appropriate to consider modifications of the 8-hour standard with a more complete body of information in hand rather than to initiative a change in the standard at this time." This language was incorporated in significant respects at page 252 of the final proposal now posted on EPA's website. The OMB transmitted litany of uncertainties associated with health effects below the current standard is in direct contrast with CASAC's unwavering unanimous statements, recounted above, that there are a suite of adverse health effects below the current standard that compel EPA action and that there is no longer significant scientific uncertainty that the standard must be lowered.

• The final document in the fax from OMB to EPA invokes three separate strands of argument in seeking to buttress EPA's case for inaction. First, the OMB language argues, paradoxically, that the sluggish implementation pace of the current ozone health-standard should delay a new health standard. Second, OMB maintains that the likely delays in achieving a more protective health standard preclude the Administrator from considering the health benefits of lower ozone and, therefore, lowering the health standard will not realize public health gains. Third, it is claimed

[30]EPA Staff Email to David Rostker, OMB (Feb. 23, 2007), Appendix A.
[31]EPA Staff Email to David Rostker, OMB (March 29, 2007), Appendix B.
[32]72 Fed. Reg. 28,098 (May 18, 2007).
[33]OMB Interagency Fax, available at EPA-HQ-OAR–2005–0171–0215, p. 1, Appendix C (emphasis added).

that the nation's alternative fuels program may supersede the Administrator's duty to establish standards requisite to protect public health with an adequate margin of safety. On this latter point, the language that appears in final form on pages 251–52 expressly cross-references back to Justice Breyer's concurrence, thereby completing the circle with the first insertion above. The actual final language incorporated at OMB's behest provides: "The Administrator is mindful that the country has important goals related to the increase production and use of renewable energy, and that these new energy sources can have important public health, environmental and other benefits, such as national security benefits. In some contexts and situations, however, the use of renewable fuels may impact compliance with a lowered ozone NAAQS standard. For example, the Agency recently promulgated final regulations pursuant to section 211(o) of the Clean Air Act, which was enacted as part of the Energy Policy Act of 2005. This provision requires the use of 7.5 billion gallons of renewable fuel by 2012, a level which will be greatly exceeded in practice. In the Regulatory Impact Analysis which accompanied the renewable fuel regulations, the Agency recognized the impact of this program on emissions related to ozone, toxics and greenhouse gases and otherwise reviewed the impacts on energy security. The Administrator requests comment on such factors and any relationship to this rulemaking, including the extent of EPA's discretion under the Clean Air Act to take such factors into account (see section I.A)." This final portion of the OMB fax was incorporated in large part at pages 251–52 of the final proposal now available on EPA's website.

While the nation's interest in renewable fuels is well-understood, OMB's language inverts the public health protection mandate of the law. OMB's approach would supersede the statute's directive to establish NAAQS that protect public health with an adequate margin of safety for ozone, particulate pollution, lead or any other pollutant by invoking a favored industrial activity or process. In such an illogical world, emissions would inexorably rise as the nation's health standards are adjusted upward to accommodate more pollution.

The rushed OMB fax, which was belatedly inserted into EPA's formal proposal, provides an array of technical, policy and legal arguments designed to justify EPA inaction OMB also pressed for inclusion of the language in the Administrator's own voice. In one revealing passage, the OMB transmitted fax asks whether it is "Possible to include as Administrator's voice or somewhere other than the five pages of input from 'commenters'?"

The Clean Air Scientific Advisory Committee Issued a Unanimous, Clarion Call for the Administrator to Adopt an Ozone Standard More Protective of Public Health

The CASAC has unanimously called for a more protective health standard. It has unambiguously advised EPA that there is no scientific basis for retaining the current health standard. But some political forces have directly commanded important aspects of EPA's proposal.

Today, Administrator Johnson holds the trust of healthier air in his hands. Like the Administrators that preceded him, he is confronting powerful headwinds. We respectfully ask that Administrator Johnson follow the path of science in protecting human health, that he heed the course charted by EPA's own unanimous 23 member independent science advisory committee, and that he be guided by EPA's own professional staff in continuing the nation's critical race for healthier air. We ask that he carry forward the legacy entrusted to him under the Clean air Act to protect human health from ground-level ozone with an adequate margin of safety.

ECHOES FROM THE PAST

In 1997, EPA strengthened the nation's particulate matter and ozone health standards in response to new science. EPA's decision engendered claims of economic demise and social havoc from representatives of industry and Members of Congress.

- "So economically you are strangled, you are hung up, you are not going to grow, jobs will not occur." Congressman Ronald Klink.[34]
- The new standards "will wreak havoc on economic growth, jobs, and even personal lifestyles." Congressman Fred Upton.[35]

[34] 143 Cong. Rec. 3560 (1997).
[35] 143 Cong. Rec. 1286 (1997).

• "Dry cleaning establishments, hair salons, and other small businesses will not be able to absorb the increased costs imposed by these regulations." Senator Spencer Abraham.[36]

These claims are not dissimilar from arguments being made now about ozone. But, during the 1997 debate, Senator Max Baucus provided perspective on the predictable cycle of discourse that ensues from EPA's decision to strengthen the nation's air quality standards. He recounted the inevitable prognostications of economic demise. He also explained a world where, in the final analysis, costs are in fact reasonable and millions breathe cleaner air:

This is a familiar pattern. Air quality standards have always been met with claims of economic demise. But then technology catches up. Innovative programs are implemented. Further research bolsters the initial decision. In the end, costs are a fraction of initial claims, and everyone breathes cleaner air.

A BIPARTISAN AMERICAN LEGACY

I leave you with the retrospective of former Senator Howard Baker, Jr., who reviewed the historic Clean Air Act legacy forged through the bipartisanship of the 1970 U.S. Senate and gave life to a law "which more than well demonstrated that the whole is greater than the sum of its parts."

Retrospectives are interesting for people of my generation. There are many ways to sum up our careers. Many Members of Congress do that with the myriad pictures and awards they display on the walls of their offices. Others summarize their career by pointing to their elective and appointive achievements. Needless to say, mine has been bountiful thanks to my parents, the people of Tennessee, President Ronald Reagan and President George W. Bush.

But at the end of the day, those personal achievements and rewards will be of most importance to my descendants and, hopefully, to my biographers. They will be measures of my success, but they won't reflect the achievement of which I am most proud. But so long as the Clean Air Act, its principles and goals survive, I will have a lasting legacy.

I have always been struck by the fact that Thomas Jefferson insisted that his tombstone reflect only that he had founded the University of Virginia—not that he was Ambassador to France—or Secretary of State—or Vice President or even President of the United States—not that he had drafted the Declaration of Independence, but that he had founded an institution of higher learning.

I cannot compare my own career to Jefferson's, nor would I be so bold to say that I alone wrote the Clean Air Act. But I am willing to say and let my legacy rest on the fact that I was one of two or three American citizens who happened to be United States Senators who came together at a particular moment in history and developed the concept which in many respects can be said to have changed the world in which we live.

In 1969 Senator Ed Muskie and I came together with a shared vision. We each provided critical elements to that vision and we succeeded in producing a law which more than well demonstrated that the whole is greater than the sum of its parts.[37]

Basing the nation's health-based air quality standards on public health concerns is, singularly, the most important principle woven into the vibrant fabric of the bipartisan Clean Air Act. The resulting benefits for healthier air have in fact changed the world in which we live.

Senator CARPER. Thank you very much, Ms. Patton.

Dr. McClellan, in recognizing you, let me just note that earlier, before he left, actually at the beginning of the hearing, Administrator Johnson was up here talking with Senator Boxer and I was congratulating her on her latest grandchild. He mentioned the fact that he had five grandchildren of his own. My friend, George Voinovich here, has seven, no fewer than seven grandchildren.

But none of them, in fact probably no one in this room but you actually had a grandchild with you. And I am going to ask you, before you give us your testimony, that you take a moment and intro-

[36]143 Cong. Rec. S10813 (1997).

[37]Remarks by Howard H. Baker, Jr., "Cleaning America's Air—Progress and Challenges," The University of Tennessee, Knoxville, March 9, 2005.

duce this 8 year old young man who is sitting right behind Jim Werner. Would you do that, please?

Before you do, let me just say, Christi Whitman, who used to be EPA Administrator and was a colleague of ours when we were Governors, Christi Whitman said to me not long ago after the birth of her grandchildren, she said to me, grandchildren are one of the few things in the world that are not overrated.

[Laughter.]

Mr. MCCLELLAN. I certainly agree with that. Thank you very much.

I would like to introduce my grandson, Connor Byrne, if you will just stand up. He is from Portland, Oregon. He took time from his vacation with us in New Mexico to come here today for this hearing.

[Applause.]

Senator CARPER. Thank you for coming. Welcome.

I am going to watch very carefully to see if your lips move when your grandfather speaks.

[Laughter.]

Senator CARPER. Dr. McClellan, we are delighted that you are here. Dr. McClellan is an advisor in the field of Toxicology and Human Health Risk Analysis. We are glad that he is here. Thank you.

STATEMENT OF ROGER O. McCLELLAN, ADVISOR, TOXICOLOGY AND HUMAN HEALTH RISK ANALYSIS

Dr. MCCLELLAN. Good morning, Senator Carper, Senator Boxer and Senator Voinovich. It is a pleasure to again appear before this Committee and offer you my views on EPA's current review of the ozone standard. I request that my written testimony be entered into the record as though read in its entirety.

Senator CARPER. And I assure you that it will be.

Dr. MCCLELLAN. My testimony today draws on my experience serving on many EPA science advisory committees, including the Clean Air Scientific Advisory Committee, which I chaired from 1988 to 1992, and on CASAC panels that have considered all of the criteria pollutants, including ozone.

I wish to make several points today concerning the current review. These are my professional opinions on the science that undergirds this very important standard. The issue at hand is not does ozone do bad things. Ozone is capable of being injurious to public health. The question is one of at what level do we set the standard for an averaging time of 8 hours to protect public health.

It is important to recognize that ozone in the ambient air arises from precursors that are both natural and man-made in origin. Ozone concentration vary throughout the day and throughout the year. As the level of the standard is reduced, it is important to recognize that the portion of the ozone in the air that we can control is reduced, because it is laid on top of natural background levels of ozone.

Thus, the issue of the policy relevant background for ozone is very important. I will simply say that in this case, EPA got the science wrong in specifying the policy background level of ozone.

This has very important implications for setting the standard and, ultimately, attaining the standard.

There is data on the health effects of exposure to ambient levels of ozone. We have heard reference to the controlled human exposure studies. There is clear evidence of functional changes above 0.08 ppm. What EPA did in this case is to re-analyze the data of one investigation, Adams, and purport that it shows effects below 0.08. This is a matter of considerable scientific debate.

Another source of data are the long-term epidemiological studies. These same studies were used to show that particulate matter had effects on mortality. They have not shown an effect of long-term exposure to ozone on mortality. There have been many time series analyses done. Professor Bell has referred to some of those. I would emphasize that the results have been quite variable, with significant associations of ozone concentrations observed in a few cities, while there is no statistical association between ozone exposure and mortality in most cities, including many cities that would be impacted by a reduced standard.

The risk assessment done by the ABT Associates and used by EPA to inform the policy judgments in setting the ozone standard is seriously flawed. The assessment depends primarily on ozone concentration-response functions derived using 1 hour maximum ozone levels and 24 hour ozone concentrations. The ozone standard pre-1997 used a 1-hour averaging time. The ozone standard has never used the hour averaging time. Only 2 coefficients out of 96 coefficients used in the risk assessment were based on 8 hour ozone concentrations, the averaging time of the current and the proposed standard.

Thus, the calculated excess risks ascribed to recent ozone concentrations are of questionable relevance to setting the standard with an 8-hour averaging time. The risk assessment simply is flawed and needs to be redone. Moreover, the calculated reductions in excess risk attributed to man-made ozone are not realistic, because of the inappropriate assumptions made about the policy relevant background of ozone.

It is my opinion that the CASAC ozone panel did not adequately pursue critical scientific issues concerning the policy relevant background, the short term mortality studies, the averaging time and the impact of these issues on the scientific validity of the ozone risk assessment. The panel, in a rush to judgment imposed by the court ordered schedule offered a collective policy judgment, on the level of the standard. The range they recommended reflects their personal policy preferences.

In my professional judgment, the Administrator's proposed decision to revise the existing ozone standard by lowering the level is a policy judgment based on a flawed and inaccurate presentation of science that should have informed the policy decision. I applaud the Administrator's decision to solicit comments on alternative levels up to the present standard.

In closing, let me comment on the references made to earlier meetings with EPA and OMB officials. As a scientist of ozone and the standard setting process I visited with EPA officials, including Mr. Robert Meyers. During the visit he was informed that we would also be meeting with OMB officials. As I recall he was in-

vited to attend the OMB meeting. At both meetings, I emphasized the same points I have made here today.

Thank you for this opportunity to appear before you.

[The prepared statement of Dr. McClellan follows:]

STATEMENT OF ROGER O. MCCLELLAN, ADVISOR, TOXICOLOGY AND HUMAN HEALTH RISK ANALYSIS

Good Morning, Mr. Chairman and Members of the Subcommittee. Thank you for the invitation to present my views on the U.S. Environmental Protection Agency's current review of the National Ambient Air Quality Standards (NAAQS) for Ozone.

My biography is attached to this statement (Attachment 1). Since 1999, I have served as an Advisor to public and private organizations on issues related to air quality in the ambient environment and workplace drawing on more than 45 years of experience in comparative medicine, toxicology, aerosol science, and risk analysis. Prior to 1999, I provided scientific leadership for two organizations, the Chemical Industry Institute of Toxicology in Research Triangle Park, NC and the Lovelace Inhalation Toxicology Research Institute in Albuquerque, NM, that earned an international reputation for developing scientific information under-girding occupational and environmental health standards.

The testimony I offer today also draws on my experience serving on numerous scientific advisory committees. This has included service on many EPA Scientific Advisory Committees from the origin of the Agency to date, including the Clean Air Scientific Advisory Committee (CASAC), which I chaired from 1988 to 1992, and on CASAC Panels that have considered all the criteria pollutants at various times. I served on the CASAC Ozone Panel that reviewed the basis for the NAAQS promulgated in 1997. I did not serve on the most recent CASAC Ozone Panel. I have followed the current NAAQS Ozone review process from its inception in September 2000 to date. The testimony I offer today reflects my own views on that review process and the science that should inform policy judgments on any revision of the NAAQS for Ozone. In Attachment 2, I briefly review the NAAQS process as background for my comments.

I wish to make the following points:

(1) The ozone present in the ambient air arises both from natural processes and from precursors that are of man-made origin. Ambient ozone concentrations vary by time of day, season and location across the country.

(2) Since promulgation of the original NAAQS for the criteria pollutants most cities in the U.S. have made remarkable progress in substantially reducing ambient concentrations of ozone and other criteria pollutants. As ambient concentrations of ozone are reduced the fraction of remaining ozone associated with precursors of manmade US emissions ? the only part which we can control through policy ? falls. This makes further reductions in ambient ozone a challenge in many areas.

(3) The Policy Relevant Background for Ozone used by the EPA is not a scientifically valid projection of the part of ozone that would not be controllable through policy. For one thing, it excludes the contribution of Mexico and Canada's emissions to U.S. ozone concentrations and does not adequately model ozone concentrations across the U.S. The projected mean and high range concentrations are unrealistically low. These scientific inadequacies result in unrealistically high mathematical projections of mortality and morbidity from low concentrations of ozone with excess risks being inappropriately attributed to ozone from anthropogenic precursors. Moreover, the failure to accurately project the upper end of the background ozone range may result in a policy judgment to set a NAAQS that will frequently be exceeded due to ozone that is not related to precursors of ozone from man-made sources in the U.S. I am pleased that the "proposed rule" recognizes the shortcomings in considering the "Policy Relevant Background" (see pg 155, footnote 40 of the Proposed Rule) and intends to address this issue.

(4) Data on the potential health effects of exposure to ambient levels of ozone that should inform policy judgments on the NAAQS are from five kinds of studies; human clinical studies, three kinds of epidemiological studies, and toxicological studies. I will briefly describe the evidence for each of these kinds of evidence.

(a) The human clinical studies conducted with controlled exposure of exercising human volunteers provide useful information on changes in respiratory function with extreme levels of ozone intake. There is clear evidence of functional changes with protracted exposure to ozone at concentrations of 0.08 ppm and higher. In this review, EPA has re-interpreted data developed by one investigator and purport to show that exposures below 0.08 ppm cause functional changes. The validity of this re-interpretation and the significance of the functional changes are open to debate.

(b) Major long-term epidemiological studies have not shown an association between ozone exposure and long-term mortality. These studies, which compare the life expectancies of groups of people living in areas with different long-term average pollutant concentrations, were used to show an association between Particulate Matter and long-term mortality.

(c) Time-series analyses consider the association between daily fluctuations in ambient ozone concentrations and day to day death rates within a particular city or other locale. These have yielded variable results, statistically significant associations with ozone concentrations have been observed in a few cities while there is no association between ambient ozone and increased short-term mortality for many cities even when the studies have been conducted using the higher ozone levels found several decades ago. (I elaborate on these issues in Attachment 4).

(d) Panel studies follow a specific group of people, often a group of children, intensively for short periods of time, measuring specific health outcomes—such as asthma symptoms ? and assesses how these outcomes are correlated to an air pollution mixture that includes ozone. These too have yielded variable results. When positive effects are observed in some studies it is not apparent the effects are attributable to ozone exposure.

(e) An enlarging body of toxicological data provides a basis for hypothesizing how ozone may cause biological changes with relatively high, short-term exposures to ozone, exposures in excess of the current ozone NAAQS. This information cannot be reliably extrapolated to ambient ozone levels currently observed across the United States.

(5) The risk assessment conducted by Abt Associates and used by EPA to inform policy judgments in setting the ozone NAAQS is seriously flawed. The assessment depends primarily on ozone concentration-response functions derived primarily using 24-hour ozone concentrations. Only two coefficients of 96 used in the risk assessment is based on 8-hour ozone concentrations, the averaging time of the current and proposed NAAQS. Thus, the calculated excess risk ascribed to the ozone concentrations measured in 2002, 2003, and 2004 are likely not relevant to setting a NAAQS with an 8-hour averaging time. Moreover, the calculated reductions in excess risk attributed to ozone are not realistic because of the inappropriate assumptions made about Policy Relevant Background for ozone. (I elaborate on these issues in Attachment 5).

(6) It is my opinion that the CASAC Panel did not adequately pursue critical scientific issues concerning Policy Relevant Background, the short-term mortality studies, the averaging time and the impact of these issues on the scientific validity of the ozone risk assessment. It is my opinion that the Panel, in a "rush to judgment" offered a collective policy judgment as to the level of the NAAQS for ozone. The scientific rationale for their collective policy judgment preference has not been articulated in the transcripts of public meetings or their letters to the Administrator.

(7) In my professional judgment, the Administrator's "proposed decision to revise the existing 8-hour O3 primary standard by lowering the level to within a range from 0.070 to 0.075 ppm" is a policy judgment based on a flawed and inaccurate presentation of the science that should inform the policy decision. I applaud the Administrator's decision to "solicit comments on alternative levels—up to and including retaining the current 8-hour standard of 0.08 ppm."

ATTACHMENT 1

BIOGRAPHY

Roger O. McClellan is currently an advisor to public and private organizations on issues concerned with inhalation toxicology and human health risk analysis. He received his Doctor of Veterinary Medicine degree with Highest Honors from Washington State University in 1960 and a Master of Management Science degree from the University of New Mexico in 1980. He is a Diplomate of the American Board of Toxicology, a Diplomate of the American Board of Veterinary Toxicology and a Fellow of the Academy of Toxicological Sciences.

He served as Chief Executive Officer and President of the Chemical Industry Institute of Toxicology (CIIT) in Research Triangle Park, NC from September 1988 through July 1999. The CIIT continues today as The Hamner Institute. During his tenure, the organization achieved international recognition for the development of science under-girding important environmental and occupational health regulations. Prior to his appointment as President of CIIT, Dr. McClellan was Director of the Inhalation Toxicology Research Institute, and President and Chief Executive Officer of the Lovelace Biomedical and Environmental Research Institute, Albuquerque, New Mexico. The Institute continues operation today as a core element of the Lovelace Respiratory Research Institute. During his 22 years with the Lovelace or-

ganization, he provided leadership for development of one of the world's leading research programs concerned with the toxic effects of airborne radioactive and chemical materials. Prior to joining the Lovelace organization, he was a scientist with the Division of Biology and Medicine, U.S. Atomic Energy Commission, Washington, DC (1965–1966), and Hanford Laboratories, General Electric Company, Richland, WA (1959–1964). In these assignments, he was involved in conducting and managing research directed toward understanding the human health risks of internally deposited radionuclides.

Dr. McClellan is an internationally recognized authority in the fields of inhalation toxicology, aerosol science and human health risk analysis. He has authored or coauthored over 300 scientific papers and reports and edited 10 books. In addition, he frequently speaks on risk assessment and air pollution issues in the United States and abroad. He is active in the affairs of a number of professional organizations, including past service as President of the Society of Toxicology and the American Association for Aerosol Research. He serves in an editorial role for a number of journals, including continuing service as Editor of Critical Reviews in Toxicology. He serves or has served on the Adjunct Faculty of 8 universities.

Dr. McClellan has served in an advisory role to numerous public and private organizations. He has served on senior advisory committees for 8 Federal agencies. He is past Chairman of the Clean Air Scientific Advisory Committee, Environmental Health Committee, Research Strategies Advisory Committee, and Member of the Executive Committee, Science Advisory Board, U. S. Environmental Protection Agency; Member, National Council on Radiation Protection and Measurements; Member, Advisory Council for Center for Risk Management, Resources for the Future; a former Member, Health Research Committee, Health Effects Institute; and service on National Academy of Sciences/National Research Council Committees on Toxicology (served as Chairman for 7 years), Risk Assessment for Hazardous Air Pollutants, Health Risks of Exposure to Radon, Research Priorities for Airborne Particulate Matter, as well as the Committee on Environmental Justice of the Institute of Medicine. He has recently completed a term on the Board of Scientific Councilors for the Centers for Disease Control and Prevention for Environmental Health Research and the Agency for Toxic Substances and Disease Registry. He is currently serving on the National Institutes of Health Scientific Advisory Committee on Alternative Toxicological Methods and the National Aeronautics and Space Administration Lunar Airborne Dust Toxicity Advisory Group.

Dr. McClellan's contributions have been recognized by receipt of a number of honors, including election in 1990 to membership in the Institute of Medicine of the National Academy of Sciences. He is a Fellow of the Society for Risk Analysis, the Health Physics Society, and the American Association for the Advancement of Science. In 1998, he received the International Achievement Award of the International Society of Regulatory Toxicology and Pharmacology of standing contributions to improving the science used for decision making and the International Aerosol Fellow Award of the International Aerosol Research Assembly for outstanding contributions to aerosol science and technology. He received the Society of Toxicology 2005 Merit Award for a distinguished career in toxicology. In 2005, The Ohio State University awarded him an Honorary Doctor of Science degree for his contributions to the science under-girding improved air quality. In 2006 he received the New Mexico Distinguished Public Service Award. He has a long-standing interest in environmental and occupational health issues, especially those involving risk assessment and air pollution, and in the management of multidisciplinary research organizations. He is a strong advocate of risk-based decision making and the need to integrate data from epidemiological, controlled clinical, laboratory animal and cell studies to assess human health risks of exposure to toxic materials.

ATTACHMENT 2

Setting National Ambient Quality Standards

Each NAAQS consists of four elements: (a) an indicator (such as ozone for photochemical oxidants, (b) an averaging time (such as 8 hours), (c) a numerical level (such as 0.08 ppm ozone averaged over 8 hours), and (d) a statistical form (such as the annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years.

Under the Clean Air Act, the EPA Administrator is required to review the NAAQS for the criteria pollutants at 5-year intervals to evaluate whether or not the four elements of the NAAQS are still deemed to be acceptable based on current scientific knowledge as it applies to the assessment of public health risks. In practice, the interval between reviews has been longer. The process for review and promulgation of a NAAQS, either continuation of the existing standard or establishing a new

NAAQS, consists of multiple phases. The initial phase, which is obviously on-going, consists of conduct of research on the various criteria pollutants. This includes a broad spectrum of activities; understanding emissions of pollutants, transport and transformation of pollutants in the atmosphere, ambient measurements of pollutants, estimation of personal exposures to pollutants, assessment of toxic effects and mechanisms of action in cells, tissues and animals, conduct of controlled exposure studies to pollutants in human volunteers and epidemiological investigations of human populations. Most of the research is funded by the EPA, some in the Agency's own laboratories and some in academic and other laboratories, the National Institutes of Health and, to a modest extent, private industry. The dominance of Federal Government support of research on criteria pollutants relates to their effects being of broad societal concerns with the pollutants, by and large, having no unique industrial emission source.

The findings of this research are used by the EPA's Office of Research and Development to prepare a criteria document (CD). Each CD traditionally has been essentially an encyclopedia of everything known about a given criteria pollutant and is used as a basis of information for the preparation of a Staff Paper (SP) by the EPA's Office of Air Quality Planning and Standards. This is a Policy Assessment of Scientific and Technical Information; in short, an integration and synthesis of the information in the CD that is most relevant to setting the four elements of a NAAQS. In recent years, the Staff Papers have made substantial use of risk assessments for the criteria pollutant being considered. These risk assessments have been conducted by a single EPA Contractor organization. The various versions of the CD and SP are released to the public with an invitation to provide comments as a basis for improving the documents.

Throughout this process, a Clean Air Scientific Advisory Committee Panel, operating as an element of the EPA's Science Advisory Board, is involved in reviewing and advising on the scientific content of both the CD and the SP, including the related risk assessment. This has typically involved several revisions. Prior to the current cycle of ozone review, the CASAC Panel sent a closure letter to the EPA Administrator when the CASAC was of the opinion that the revised documents were suitable for use by the Administrator in promulgating a NAAQS. In the current ozone review, the "closure letter" process was abandoned. Instead, the current CASAC Ozone Panel has focused on offering a consensus opinion.

At the next step, the Administrator proposes, via a Federal Register Notice, a NAAQS including specific proposals for each of the four elements of the NAAQS; the indicator, averaging times, numerical levels and statistical forms. Comments are solicited from the Public with the opportunity to submit written comments to a specific Docket. The Administrator, acting under a Consent Decree, signed a "Proposed Rule."

The next step is for the Administrator to promulgate a NAAQS consisting of the four elements discussed previously. I purposefully do not use the phrase ? "final step," because the Courts may have a role in deciding whether the Administrator's proposed NAAQS for Ozone will stand. The NAAQS are to be based on the available scientific information reviewed in the CD and SP and summarized in the notice of proposed rules. The primary, health-based NAAQS are to be set at a level that will protect public health, including sensitive populations, with an adequate margin of safety. The Administrator is precluded from considering cost in the setting of the NAAQS.

At this point, I would like to emphasize that there exists no absolute and unambiguous scientific methodology that can determine which specific indicator, precise averaging time, numerical level or statistical form will be adequate to protect public health. The available scientific information can inform the NAAQS decisions, however, the Administrator must ultimately use policy judgment in making decisions on each of the four elements from among an array of scientifically acceptable options including consideration of their attendant scientific uncertainties. Beyond the language in the Clean Air Act, Justice Breyer in Whitman v. American Trucking Association (531 U.S. 457, 473) has given very useful guidance for the Administrator in exercising policy judgment in the setting of NAAQS (see Attachment 3).

ATTACHMENT 3

Justice Breyer on Using Policy Judgment (from Whitman v. American Trucking Association, 531 U.S. 457, 473)

In setting standards that are "requisite" to protect public health and welfare, as provided in section 109(b), EPA's task is to establish standards that are neither more or less stringent than necessary for these purposes. Whitman v. American Trucking Associations, 531 U.S. 457, 473. In establishing "requisite" primary and

secondary standards, EPA may not consider the costs of implementing the standards. Id. At 471. As discussed by Justice Breyer in Whitman v. American Trucking Associations, however, "this interpretation of 109 does not require the EPA to eliminate every health risk, however slight, at any economic cost, however great, to the point of "hurtling" industry over "the brink of ruin," or even forcing "deindustrialization." Id. At 494 (Breyer, J., concurring in part and concurring in judgment) (citations omitted). Rather, as Justice Breyer explained:

"The statute, by its express terms, does not compel the elimination of all risk; and it grants the Administrator sufficient flexibility to avoid setting ambient air quality standards ruinous to industry.

Section 109(b)(1) directs the Administrator to set standards that are "requisite to protect the public health" with "an adequate margin of safety." But these words do not describe a world that is free of all risk ? an impossible and undesirable objective. (citation omitted). Nor are the words "requisite" and "public health" to be understood independent of context. We consider football equipment "safe" even if its use entails a level of risk that would make drinking water "unsafe" for consumption. And what counts as "requisite" to protecting the public health will similarly vary with background circumstances, such as the public's ordinary tolerance of the particular health risk in the particular context at issue. The Administrator can consider such background circumstances when "deciding what risks are acceptable in the world in which we live." (citation omitted).

The statute also permits the Administrator to take account of comparative health risks. That is to say, she may consider whether a proposed rule promotes safety overall. A rule likely to cause more harm to health than it prevents is not a rule that is "requisite to protect the public health." For example, as the Court of Appeals held and the parties do not contest, the Administrator has the authority to determine to what extent possible health risks stemming from reductions in tropospheric ozone (which, it is claimed, helps prevent cataracts and skin cancer) should be taken into account in setting the ambient air quality standard for ozone.

(Citation omitted)/

The statute ultimately specifies that the standard set must be "requisite to protect the public health" "in the judgment of the Administrator," 109(b)(1), 84 Stat. 1680 (emphasis added), a phrase that grants the Administrator considerable discretionary standard-setting authority.

The statute's words, then, authorize the Administrator to consider the severity of a pollutant's potential adverse health effects, the number of those likely to be affected, the distribution of the adverse effects, and the uncertainties surrounding each estimate. (citation omitted). They permit the Administrator to take account of comparative health consequences. They allow him to take account of context when determining the acceptability of small risks to health. And they give her considerable discretion when she does so.

This discretion would seem sufficient to avoid the extreme results that some of the industry parties fear. After all, the EPA, in setting standards that "protect the public health" with "an adequate margin of safety," retains discretionary authority to avoid regulating risks that it reasonably concludes are trivial in context. Nor need regulation lead to deindustrialization. Pre-industrial society, was not a very health society; hence a standard demanding the return of the Stone Age would not prove "requisite to protect the public health."

ATTACHMENT 4

Time-Series Analyses of Short-Term Mortality

The EPA places substantial reliance on the time-series analyses of short-term mortality in the Staff Paper and the associated Risk Assessment. To a large extent, results from the National Morbidity and Mortality Air Pollution (NMMAPs) studies being conducted at the Johns Hopkins University serve as a center piece of the EPA evaluation and risk assessment. The paper by Bell et al. (2004) is given considerable weight. Unfortunately, this study is founded on a very weak and dubious goal? the derivation of a national ozone concentration excess mortality coefficient. In my opinion, the heterogeneity of air pollution across the United States and the heterogeneity of the population, including morbidity and mortality patterns in cities across the Unites States, makes it inappropriate to create a "national" concentration-response coefficient for ozone. This task, even if appropriate, is challenging because of the very weak effect of ozone, even in the cities with the highest ozone concentrations, compared to all the other factors influencing morbidity and mortality.

To help illustrate the problems involved in interpreting the Bell et al. (2004) study, I am presenting some analyses performed by my colleague, Richard Smith (2007) at the University of North Carolina-Chapel Hill, using the NMMAPs data

kindly provided by the Johns Hopkins University investigators. Figure 1 was developed by Professor Smith and is essentially identical to Figure 2 in the Bell et al. (2004) paper. His reproduction of the results of Bell et al. (2004) is reassuring. You will note this figure, developed using a Bayesian statistical approach, indicates values for a percent rise in mortality per 10 ppb average 24-hour ozone and the associated confidence intervals. Note that even with the Bayesian analysis, only six cities (Houston, Dallas-Ft. Worth, Newark, Philadelphia, Chicago and New York) have statistically significant associations between 24-hour average ozone and short-term mortality. At the bottom of Figure 1 is shown a national concentration-response coefficient. It agrees well with the value of 0.52 percent (95 percent Confidence Interval, 0.27–0.77 percent) for 10 ppb increase in the 24-hour average ozone concentration given in the Bell et al. (2004) paper. I personally do not believe this national value is of much use ? this is a case where "one size does not fit all."

In my opinion, I think it is important to also consider raw estimates of the ozone ambient concentration response coefficients developed for the specific cities. The estimates prepared by Professor Smith are shown in Figure 2. Note that the scale in Figure 2 is expanded compared to Figure 1. These estimates for the individual cities have substantial statistical validity because the observations are based on 14 years of data from cities whose size is such that a substantial number of deaths were observed over that time period. It may be noted in this graph that the six cities that had positive coefficients in the Bayesian analysis plus one other city, Cincinnati, (Fig. 1) had raw estimate coefficients that were also positive and statistically significant. Thirty-four cities had negative coefficients.

When reviewing the Bell et al. (2004) results, it is useful to recall the averaging time used for the NAAQS for ozone. It is not the 24-hour average ozone considered in detail by Bell et al. (2004), it is the 8-hour maximum concentration. Thus, the Bell et al. (2004) analyses as presented are not directly applicable to setting the NAAQS for ozone nor in calculating health risks/benefits of alternative NAAQS. Bell et al. (2004) does give an overall national coefficient for the daily 8-hour maximum. It is 0.64 percent (95 percent Confidence Interval, 0.41 percent–0.86 percent) for a 15 ppb increase in the daily 8-hour maximum. Note that the denominator used for the 8-hour maximum ozone increase in 15 ppb in contrast to the 10 ppb used for the 24-hour average ozone metric. As I have already noted, it is my view that a single national ozone concentration-response coefficient is of limited value because of the great heterogeneity of air quality and population health statistics such as for morbidity and mortality, that describe communities across the U.S. The results of analyses that focus on individual city results would be more scientifically valid in evaluating potential health ozone effects for any given city.

The results of analyses for the 8-hour maximum ozone metric conducted by Professor Smith are shown in Figures 3 and 4. In Figure 3, results are presented for the individual cities in the NMMAPs data base. Note that for 31 cities the raw regression coefficients are below zero, clearly no association of increased ozone short-term mortality. I am pleased that my home town, Albuquerque, NM, is one of these cities. The results should be reassuring to our mayor. Of the remaining cities, only 10 have statistically significant associations between increases in the 8-hour concentration of ozone and increased mortality. Shown in Figure 4 are the Community-specific Bayesian estimates for the 8-hour maximum ozone metric, calculated in a manner similar to Bell et al. (2004). Note that now the central values all are to the right of the zero line. However, only seven cities have positive coefficients that are statistically significant.

In my view, the community-specific estimates are highly relevant to the setting of the NAAQS. That can be illustrated in part by reviewing the data in Attachment 6. This attachment is based on EPA data and shows the 8-hour design values for individual cities. A review of the list of Core-Base Statistical Areas and their associated 8-hour design values will reveal that the cities shown to have positive associations between increases in 8-hour maximum ozone and increases in short-term mortality are near the top of the list. These cities are out of compliance with the current NAAQS for ozone, 0.084 ppm using conventional rounding techniques for the NAAQS set at 0.080 ppm.

What is equally important is to recognize that many cities shown in Figures 3 and 4 that have no statistically significant association between ambient ozone concentration and increased mortality have 8-hour design values in the range of 0.060 ppm to 0.084 ppm. This is the range for which the Administrator has solicited comments on alternative numerical standards. Indeed, many cities such as Albuquerque are in the range between 0.075 ppm (the upper end of the proposed range in the proposed rule) and 0.084 ppm. It is my view that these data provide the kind of context that Justice Breyer has indicated is a part of the considerable discretionary standard-setting authority granted to the Administrator in making policy judgments. As

a citizen of Albuquerque, NM, with an 8-hour design value of 0.077 ppm, I would have great difficulty explaining to my mayor the scientific basis for having to attain a new standard set in the range of 0.070 to 0.075 ppm, with an averaging time of 8 hours, if that were the numerical level set for the NAAQS for ozone in the final rule.

References

Bell, M.L., McDermott, A., Zeger, S.L., Samet, J.M. and Dominici, F. (2004). Ozone and Short-Term Mortality in 95 U.S. Urban Communities, 1987–2000. JAMA 292(19): 2372–2378.

Smith, Richard, Personal Communication (2007). (Professor Richard Smith is in the Department of Statistics and Operations Research at the University of North Carolina-Chapel Hill).

Figure 1

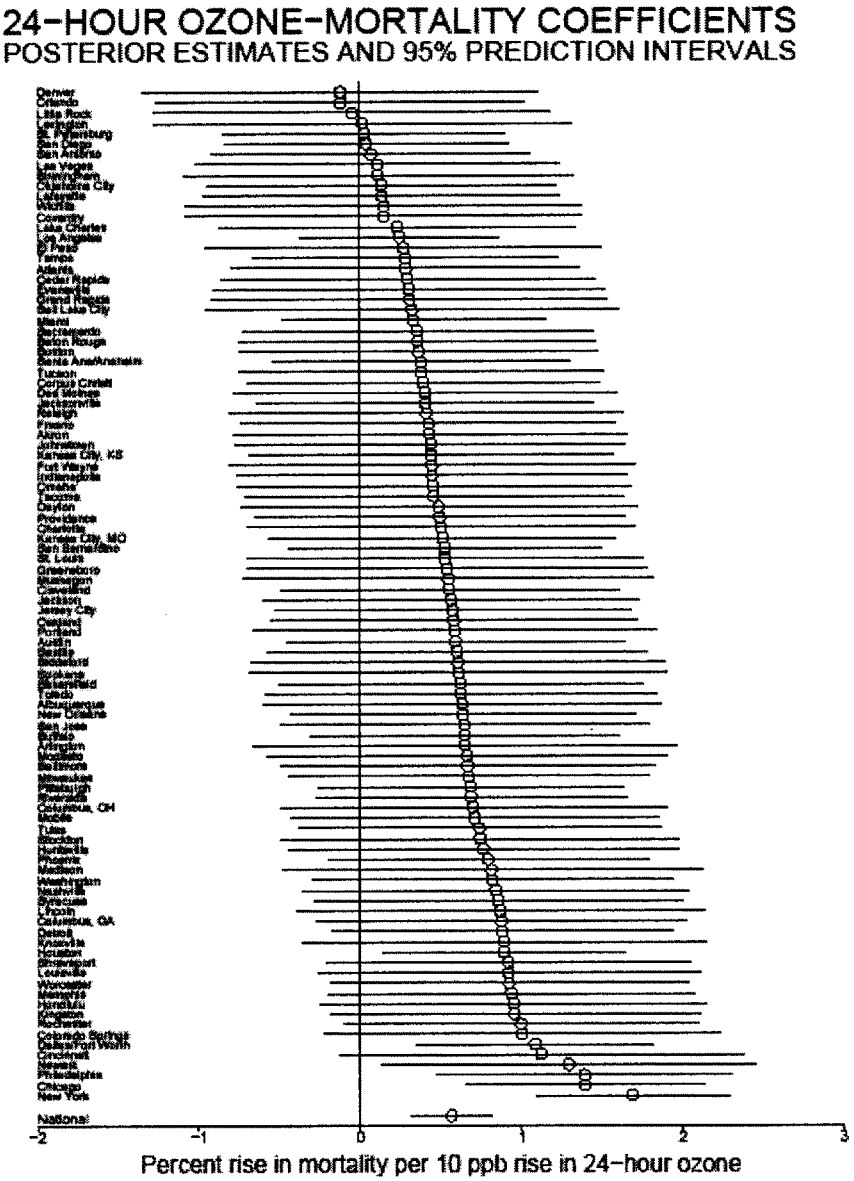

24-HOUR OZONE-MORTALITY COEFFICIENTS
POSTERIOR ESTIMATES AND 95% PREDICTION INTERVALS
Denver
Orlando
Little Rock
Lexington
St. Petersburg
San Diego
San Antonio
Las Vegas
Atlantic City
Lafayette
Wichita
Coventry
Lake Charles
Los Angeles
El Paso
Tampa
Atlanta
Cedar Rapids
Evansville
Grand Rapids
Salt Lake City
Miami
Bakersfield
Baton Rouge
Boston
Santa Ana/Anaheim
Tucson
Corpus Christi
Des Moines
Jacksonville
Raleigh
Fresno
Akron
Johnstown
Kansas City, KS
Fort Wayne
Indianapolis
Omaha
Tacoma
Dayton
Providence
Charlotte
Kansas City, MO
San Bernardino
St. Louis
Greensboro
Muskegon
Cleveland
Jackson
Jersey City
Oakland
Portland
Austin
Seattle
Bakersfield
Spokane
Bakersfield
Toledo
Albuquerque
New Orleans
San Jose
Buffalo
Arlington
Houston
Baltimore
Milwaukee
Pittsburgh
Riverside
Columbus, OH
Mobile
Tulsa
Stockton
Huntsville
Phoenix
Madison
Washington
Nashville
Syracuse
Lincoln
Columbus, GA
Detroit
Knoxville
Houston
Shreveport
Louisville
Worcester
Memphis
Honolulu
Arlington
Rochester
Colorado Springs
Dallas/Fort Worth
Cincinnati
Newark
Philadelphia
Chicago
New York
National
-2
-1
0
1
2
3
Percent rise in mortality per 10 ppb rise in 24-hour ozone

Figure 2

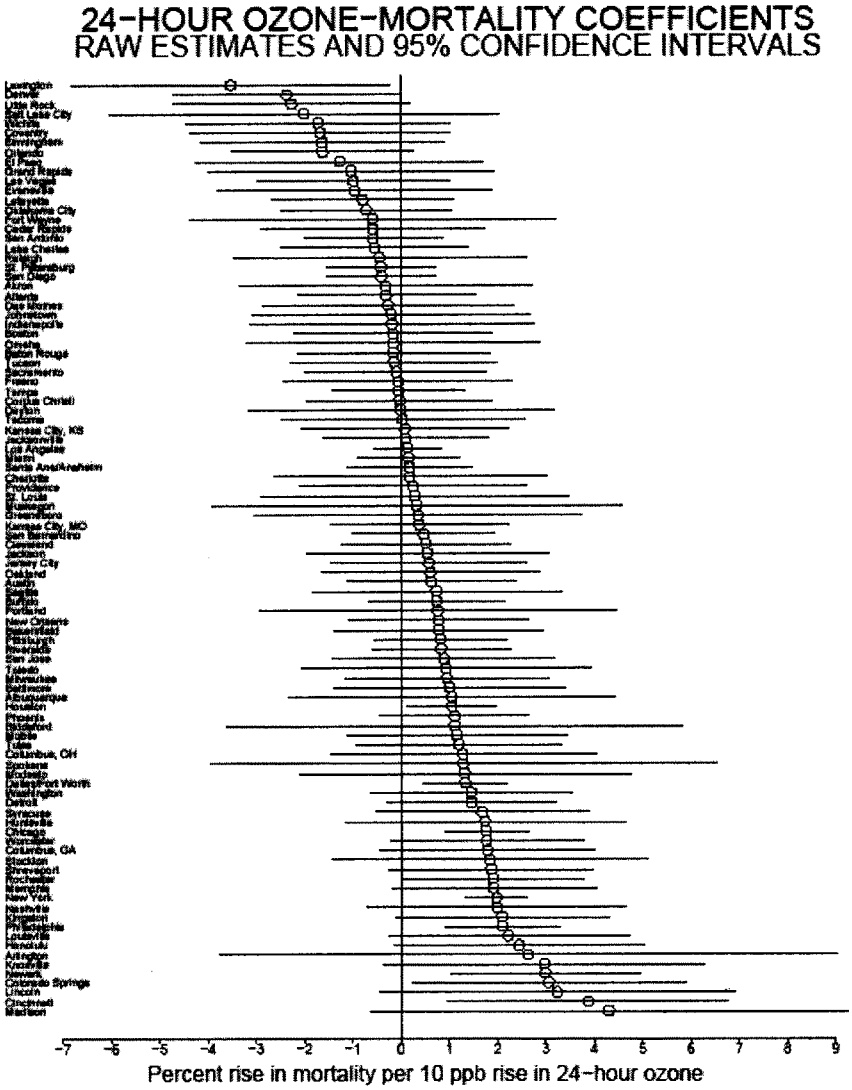

24-HOUR OZONE-MORTALITY COEFFICIENTS
RAW ESTIMATES AND 95% CONFIDENCE INTERVALS
-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9
Percent rise in mortality per 10 ppb rise in 24-hour ozone

Figure 3

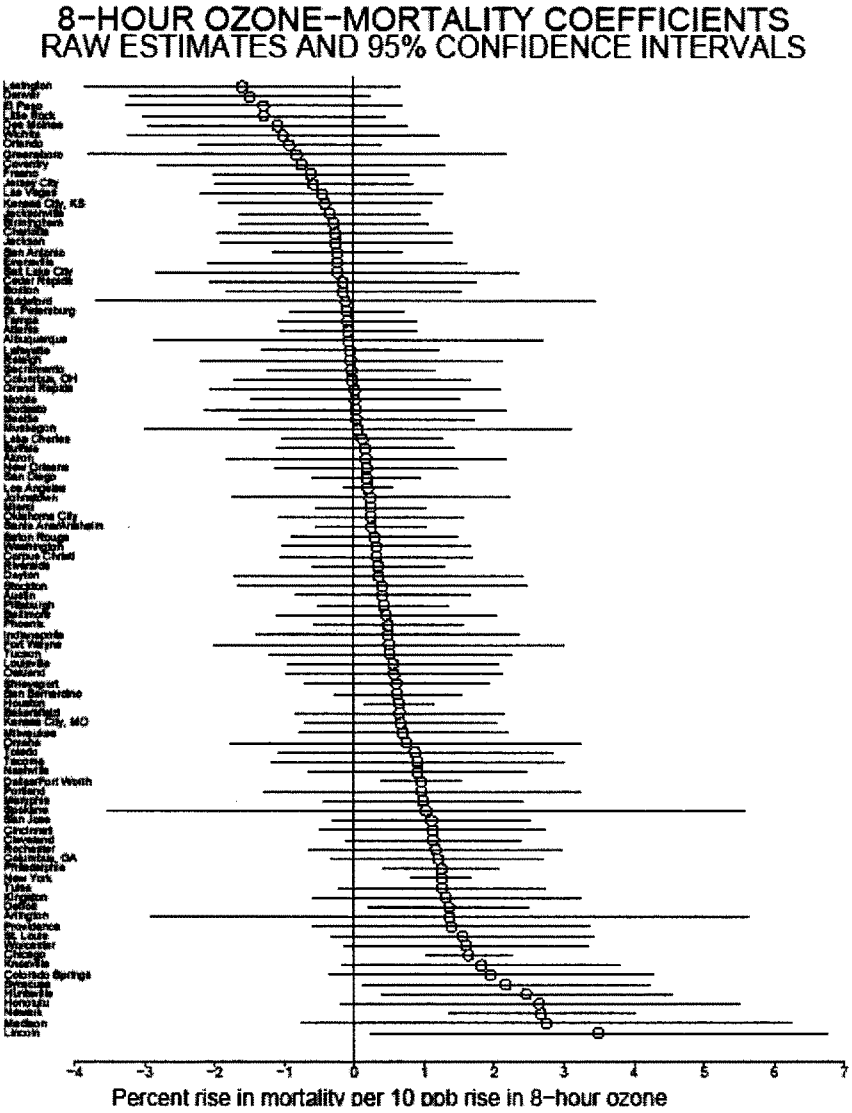
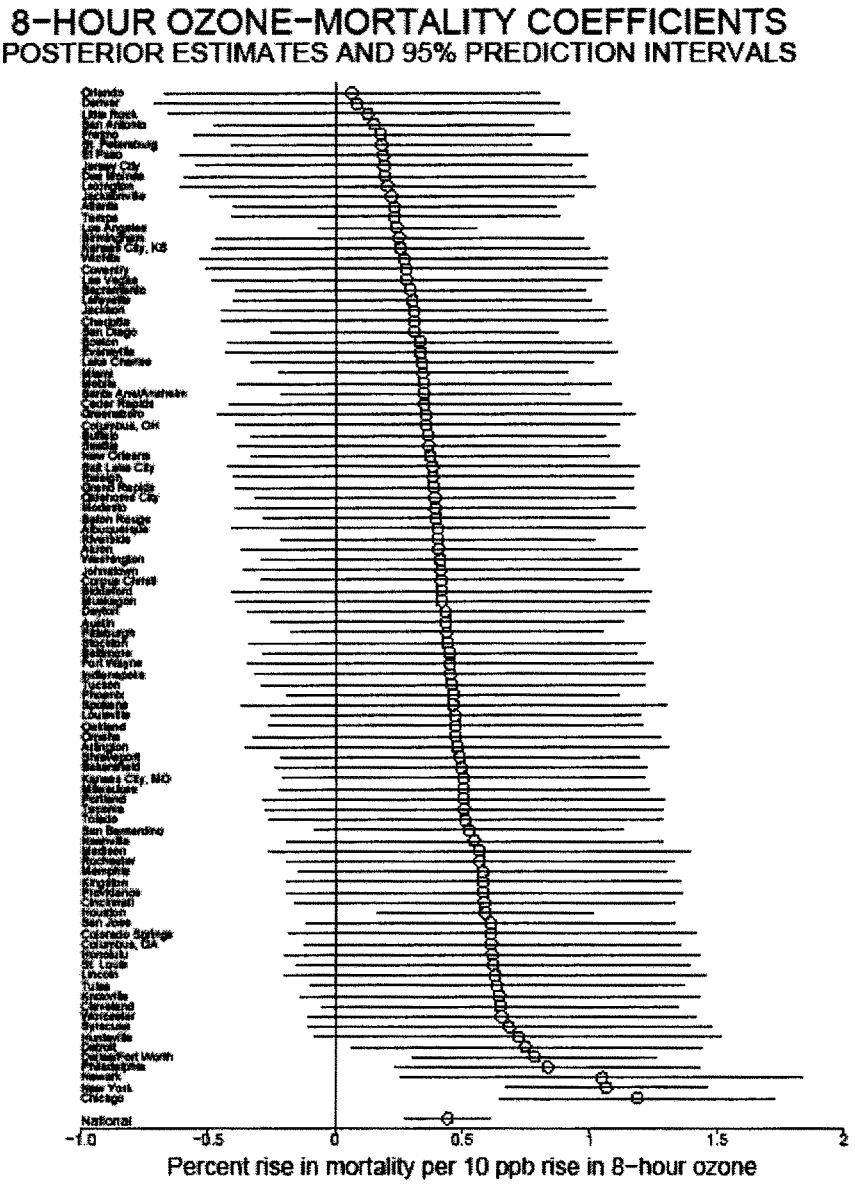

8-HOUR OZONE-MORTALITY COEFFICIENTS
RAW ESTIMATES AND 95% CONFIDENCE INTERVALS
-4
-3
-2
-1
0
1
2
3
4
5
6
7
Percent rise in mortality per 10 ppb rise in 8-hour ozone

Figure 4


8-HOUR OZONE-MORTALITY COEFFICIENTS
POSTERIOR ESTIMATES AND 95% PREDICTION INTERVALS
Orlando
Denver
Little Rock
San Antonio
Fresno
St. Petersburg
El Paso
Jersey City
San Bernardino
Lexington
Jacksonville
Atlanta
Tampa
Los Angeles
Kansas City, KS
Mobile
Coventry
Las Vegas
Sacramento
Lafayette
Jackson
Charlotte
San Diego
Boston
Evansville
Lake Charles
Miami
Mobile
Santa Ana/Anaheim
Cedar Rapids
Greensboro
Columbus, OH
Buffalo
Seattle
New Orleans
Salt Lake City
Toledo
Grand Rapids
Oklahoma City
Modesto
Baton Rouge
Albuquerque
Riverside
Akron
Washington
Johnstown
Corpus Christi
Bakersfield
Muskegon
Dayton
Austin
Pittsburgh
Stockton
Baltimore
Fort Wayne
Indianapolis
Tucson
Phoenix
Spokane
Louisville
Oakland
Omaha
Arlington
Shreveport
Bakersfield
Kansas City, MO
Milwaukee
Portland
Tacoma
Toledo
San Bernardino
Nashville
Madison
Rochester
Memphis
Kingston
Fort Monroe
Cincinnati
Houston
San Jose
Colorado Springs
Columbus, GA
Honolulu
St. Louis
Lincoln
Tulsa
Knoxville
Cleveland
Worcester
Syracuse
Huntsville
Detroit
Dallas/Fort Worth
Philadelphia
Newark
New York
Chicago
National
-1.0
-0.5
0
0.5
1
1.5
2
Percent rise in mortality per 10 ppb rise in 8-hour ozone

ATTACHMENT 5

EPA/Abt Risk Assessment

The "Ozone Health Risk Assessment for Selected Urban Areas" conducted by Abt Associates for the EPA provides key information to inform the Administrator's policy judgments in setting the NAAQS for ozone. Substantial use is made of the risk assessment in the Staff Paper and in the Proposed Rule.

There are serious problems with the present risk assessment which I will briefly comment on. Key elements of the risk assessment are: (a) the cities selected for evaluation, (b) the historical population morbidity and mortality data for these cities, (c) the estimated ambient concentrations of ozone projected for these cities, and (d) the ambient ozone concentration-response coefficients used in estimating excess risk for the identified populations.

The risk assessment and its appendices are turgid with detailed information. Unfortunately, it is not presented in a manner that is easy to grasp. It is especially noteworthy that the presentation does not provide the kind of contextual information that is needed by the Administrator to make policy judgments on setting the NAAQS for ozone. Justice Breyer's opinion referenced earlier and contained in Attachment 2 emphasizes that any calculated risk attributed to ozone needs to be placed in context relative to other risks commonly encountered by the populace. That kind of information is not made clear in the risk assessment or the Staff Paper with side-by-side comparison of the size of the population and historical data on common morbidity and mortality indices and calculated ozone attributable morbidity and mortality. The use of percentage values common in the risk assessment is not a substitute for the starkness of absolute numbers to inform policy judgments.

A major shortcoming of the risk assessment is the failure to directly link the analysis to the 8-hour averaging time used in the current and projected NAAQS for ozone. A quick reading of the risk assessment would lead one to assume that a 24-hour averaging time was to be advocated for the NAAQS for ozone. Table B.1 of the Risk Assessment lists the study specific information used. This table lists 96 ambient concentration response metrics used in the risk assessment; 80 are for 24-hour average, 14 for the 1 hour maximum and only 2 for 8-hour maximum. This leaves open the question of what the risk analysis would have revealed if an 8-hour maximum metric had been used. As discussed earlier, there is data available for the 8-hour maximum metric for all the cities evaluated in the risk assessment.

The fallacy of assuming there are some national metrics that can be used for converting from the 24-hour daily average to the 8-hour maximum values is illustrated in Figure a and b which plots the ratio of the coefficients derived using an 8-hour maximum ozone versus 24-hour daily ozone for both the raw and posterior (Bayesian) estimates for individual cities. The straight lines shown in both Figure 1a and 1b have a slope of 0.75 through the origin. The 0.75 slope is equal to 1/1.33, the 1.33 value being a ratio used to convert from an 8-hour maximum metric to the daily 24-hour average by several investigators (Bell et al., 2004; Levy et al., 2001; Thurston and Ito, 2001). It is apparent that there is a general association between the two metrics. However, it is clear that "one size does not fit all." In many cases, 24-hour daily average metric is a poor surrogate for the 8-hours maximum metric. In my view, it is crucial to use city-specific 8-hour maximum coefficients if the NAAQS for ozone is to be set with an 8-hour averaging time.

A comparison of 1a (the raw estimates) with 1b (the Bayesian posterior estimates) indicates how the Bayesian estimates are "shrunk" toward a common central value. It is my opinion that for most cities the raw estimates are sufficiently robust based on observations over 14 years in cities with populations usually exceeding 500 thousand that it is not necessary to use Bayesian techniques to bolster statistically confidence in the values. Some might argue that the use of the Bayesian approach helps sharpen the estimated concentration-response coefficients for individual cities. I argue that consideration should also be given to the city-specific raw estimates of the coefficients. If Bayesian techniques are to be used, the results might have more validity if the focus were on regional estimates rather than the creation of national ambient ozone concentration-response coefficients. In my opinion, there is need for respecting the underlying heterogeneity.

As already noted, the risk assessment is seriously flawed in that inappropriate estimates have been used for the Policy Relevant Background. By using estimates of the Policy Relevant Background developed by low resolution modeling in calculating excess risk, the risk assessment inappropriately attributes risks to ozone arising from man-made precursors that in fact is a part of the background ozone.

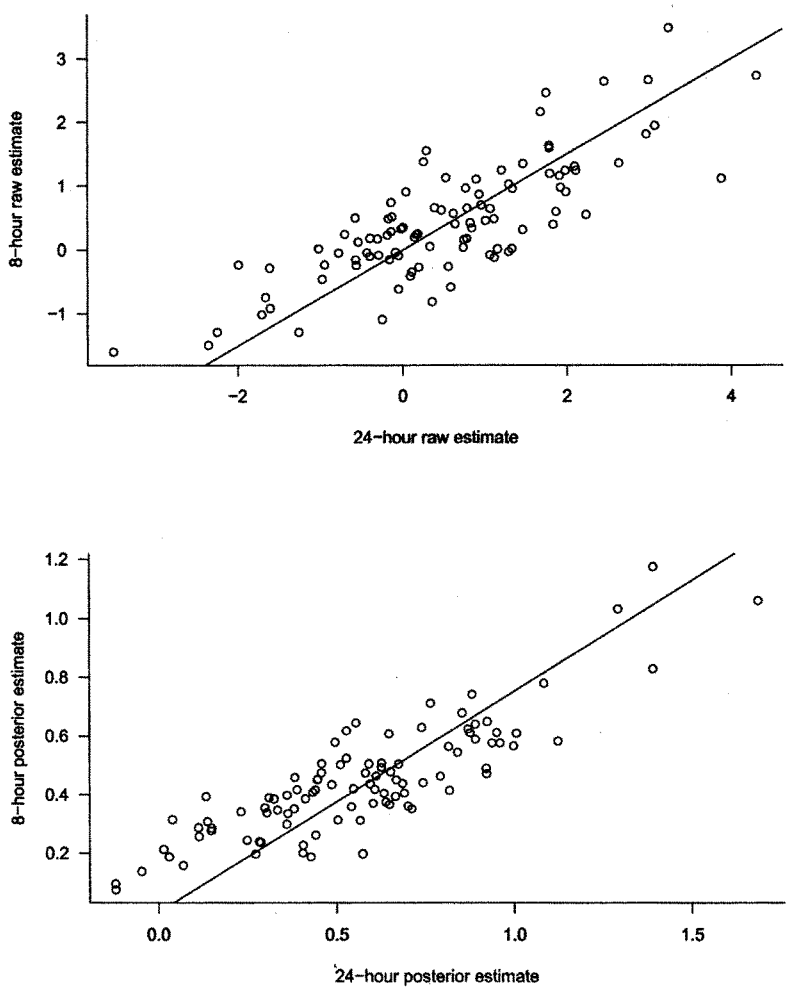
A review of the transcripts of the CASAC meetings and CASAC letters reveals that CASAC recognized that the "Policy Relevant Background" issue was not re-

solved. Unfortunately, CASAC did not adequately pursue this issue and especially the impact on the risk assessment. I am pleased that the EPA (see page 155, footnote 40 of the proposed rule) recognizes this matter needs more attention by calling for additional sensitivity analyses related to Policy Relevant Background. It is my opinion that this matter is of sufficient importance that it requires the development of amendments to the Criteria Document, Staff Paper and Risk Assessments with associated public meetings for review and comment. Indeed, it is my understanding that material germane to this issue has already been prepared by EPA contractors and was excluded by Administrative decisions from the final documentation used in the ozone NAAQS review.

It is my opinion that the Risk Assessment is so seriously flawed that it should be revised focusing on the 8-hour maximum ozone concentration-response coefficients and subjected to public comment and review. It is my contention that the flawed and inaccurate presentation of the risks of ambient ozone concentrations did not provide the Administrator with a scientifically adequate basis for making the Policy Judgments necessary in setting the NAAQS for ozone.

Figure 1. The upper panel is a plot of the ratios for individual cities of the raw estimates of the concentration metric versus the 24-hour metric. The lower panel is a plot of the posterior (Bayesian) estimates of the ozone concentration-response coefficients for the 8-hour maximum metric versus the 24-hour metric.

Figure 1. The upper panel is a plot of the ratios for individual cities of the raw estimates of the concentration metric versus the 24-hour metric. The lower panel is a plot of the posterior (Bayesian) estimates of the ozone concentration-response coefficients for the 8-hour maximum metric versus the 24-hour metric.



References

Bell, M.L., McDermott, A., Zeger, S.L., Samet, J.M. and Dominici, F. (2004). Ozone and Short-Term Mortality in 95 U.S. Urban Communities, 1987–2000. JAMA 292(19): 2372–2378.

Levy, J.L., Carrothers, T.J., Tuomisto, J.T., Hammitt, J.K. and Evans, J.S. (2001). Assessing the Public Health Benefits of Reduced Ozone Concentrations. Environmental Health Perspectives 109: 1215–1226.

Thurston, G.D. and Ito, K. (2001). Epidemiological Studies of Acute Ozone Exposures and Mortality. J. Exp. Anal. Environ. Epidemiol. 11: 286–294.

ATTACHMENT 6

Ozone 8-Hour Design Values for 2002-2004

(Extracted from Memo of Lance McCluney, USEPA, Office of Air Quality Planning and Standards, January 18, 2007)

Core-Base Statistical Areas (CBSA)	Ozone 8-Hour Design Value
Riverside-San Bernardino-Ontario, CA	0.127
Los Angeles-Long Beach-Santa Ana, CA	0.125
Bakersfield, CA	0.116
Visalia-Porterville, CA	0.105
Fresno, CA	0.104
Merced, CA	0.102
Sacramento--Arden-Arcade--Roseville, CA	0.102
Houston-Sugar Land-Baytown, TX	0.101
New York-Northern New Jersey-Long Island, NY-NJ-PA	0.099
Dallas-Fort Worth-Arlington, TX	0.098
Truckee-Grass Valley, CA	0.097
Washington-Arlington-Alexandria, DC-VA-MD-WV	0.096
Baltimore-Towson, MD	0.095
Bridgeport-Stamford-Norwalk, CT	0.095
Cleveland-Elyria-Mentor, OH	0.095
New Haven-Milford, CT	0.095
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	0.095
Ashtabula, OH	0.094
Chicago-Naperville-Joliet, IL-IN-WI	0.094
Modesto, CA	0.094
Oxnard-Thousand Oaks-Ventura, CA	0.094
Salisbury, NC	0.094
Allegan, MI	0.093
Atlanta-Sandy Springs-Marietta, GA	0.093
Hanford-Corcoran, CA	0.093
Jamestown-Dunkirk-Fredonia, NY	0.093
Beaumont-Port Arthur, TX	0.092
Charlotte-Gastonia-Concord, NC-SC	0.092
Detroit-Warren-Livonia, MI	0.092
Hartford-West Hartford-East Hartford, CT	0.092
Indianapolis-Carmel, IN	0.092
Sheboygan, WI	0.092
Boston-Cambridge-Quincy, MA-NH	0.091

Buffalo-Niagra Falls, NY Metropolitan Sta	0.091
Cincinnati-Middletown, OH-KY-IN	0.091
Columbus, OH	0.091
Knoxville, TN	0.091
San Antonio, TX	0.091
Trenton-Ewing, NJ	0.091
Wilmington, OH	0.091
Youngstown-Warren-Boardman, OH-PA	0.091
Pittsburgh, PA	0.09
Providence-New Bedford-Fall River, RI-MA	0.09
Richmond, VA	0.09
Springfield, MA	0.09
Yuba City, CA Metropolitan Statistical	0.09
Akron, OH	0.089
Anderson, IN	0.089
Baton Rouge, LA	0.089
Madera, CA	0.089
Poughkeepsie-Newburgh-Middletown, NY	0.089
San Diego-Carlsbad-San Marcos, CA	0.089
South Bend-Mishawaka, IN-MI	0.089
St. Louis, MO-IL	0.089
Toledo, OH	0.089
Torrington, CT	0.089
Vineland-Millville-Bridgeton, NJ	0.089
Allentown-Bethlehem-Easton, PA-NJ	0.088
Barnstable Town, MA	0.088
Chico, CA	0.088
Louisville-Jefferson County, KY-IN	0.088
Milwaukee-Waukesha-West Allis, WI	0.088
Norwich-New London, CT	0.088
Raleigh-Cary, NC	0.088
Dayton, OH	0.087
Durham, NC	0.087
Elkhart-Goshen, IN	0.087
Erie, PA	0.087
Green Bay, WI	0.087
Lancaster, PA	0.087
Lima, OH	0.087
Memphis, TN-MS-AR	0.087
Morristown, TN	0.087
Racine, WI	0.087
Sevierville, TN	0.087
Springfield, OH	0.087

Winston-Salem, NC	0.087
Albany-Schenectady-Troy, NY	0.086
Canton-Massillon, OH	0.086
Columbia, SC	0.086
Huntington-Ashland, WV-KY-OH	0.086
Lincolnton, NC	0.086
Macon, GA	0.086
Michigan City-La Porte, IN	0.086
Muskegon-Norton Shores, MI	0.086
Niles-Benton Harbor, MI	0.086
Virginia Beach-Norfolk-Newport News, VA-NC	0.086
Watertown-Fort Drum, NY	0.086
York-Hanover, PA	0.086
Austin-Round Rock, TX	0.085
Birmingham-Hoover, AL	0.085
Chambersburg, PA	0.085
Chattanooga, TN-GA	0.085
DuBois, PA	0.085
El Centro, CA	0.085
Flint, MI	0.085
Fort Wayne, IN	0.085
Las Vegas-Paradise, NV	0.085
Phoenix-Mesa-Scottsdale, AZ	0.085
Red Bluff, CA	0.085
Rocky Mount, NC	0.085
Seaford, DE	0.085
Ann Arbor, MI	0.084
Atlantic City, NJ	0.084
Bloomington, IN	0.084
Denver-Aurora, CO	0.084
Dover, DE	0.084
Fayetteville, NC	0.084
Grand Rapids-Wyoming, MI	0.084
Greensboro-High Point, NC	0.084
Holland-Grand Haven, MI	0.084
Kingsport-Bristol-Bristol, TN-VA	0.084
Manchester-Nashua, NH	0.084
Parkersburg-Marietta, WV-OH	0.084
Phoenix Lake-Cedar Ridge, CA	0.084
Portland-South Portland-Biddeford, ME	0.084
San Jose-Sunnyvale-Santa Clara, CA	0.084
Spartanburg, SC	0.084
State College, PA	0.084

Adrian, Ml	0.083
Augusta-Richmond County, GA-SC	0.083
Dalton, GA	0.083
Evansville, IN-KY	0.083
Hagerstown-Martinsburg, MD-WV	0.083
Longview, TX	0.083
Manitowoc, WI	0.083
Mount Vernon, OH	0.083
Muncie, IN	0.083
Nashville-Davidson--Murfreesboro, TN	0.083
Reading, PA	0.083
San Francisco-Oakland-Fremont, CA	0.083
Terre Haute, IN	0.083
Traverse City, MI	0.083
Weirton-Steubenville, WV-OH	0.083
Anderson, SC	0.082
Asheville, NC	0.082
Clarksville, TN-KY	0.082
Fort Collins-Loveland, CO	0.082
Harrisburg-Carlisle, PA	0.082
Hickory-Lenoir-Morganton, NC	0.082
Kansas City, MO-KS	0.082
Lafayette, IN	0.082
New Orleans-Metairie-Kenner, LA	0.082
Santa Barbara-Santa Maria, CA	0.082
Seneca, SC	0.082
Williamsport, PA	0.082
Altoona, PA	0.081
Charleston, WV	0.081
Granbury, TX	0.081
Greenville, NC	0.081
Kalamazoo-Portage, MI	0.081
Marshall, TX	0.081
Rochester, NY	0.081
Rockland, ME	0.081
Scranton--Wilkes-Barre, PA	0.081
Stockton, CA	0.081
Tyler, TX	0.081
Bishop, CA	0.08
Chester, SC	0.08
Corpus Christi, TX	0.08
Decatur, AL	0.08
Florence, SC	0.08

Gaffney, SC	0.08
Gettysburg, PA	0.08
Greenville, SC	0.08
Gulfport-Biloxi, MS	0.08
Huntington, IN	0.08
Johnstown, PA	0.08
Kingston, N	0.08
Lake Charles, LA	0.08
Lansing-East Lansing, MI	0.08
Owensboro, KY	0.08
Paducah, KY-IL	0.08
Pensacola-Ferry Pass-Brent, FL	0.08
Seymour, IN	0.08
Lafayette, LA	0.079
Middlesborough, KY	0.079
Mobile, AL	0.079
Mount Vernon, IL	0.079
Ogden-Clearfield, UT	0.079
Oklahoma City, OK	0.079
Roanoke, VA	0.079
Salt Lake City, UT	0.079
Tulsa, OK	0.079
Victoria, TX	0.079
Athens-Clarke County, GA	0.078
Bennington, VT	0.078
Bowling Green, KY	0.078
El Paso, TX	0.078
Huntsville, AL	0.078
Janesville, WI	0.078
Kinston, NC	0.078
Little Rock-North Little Rock, AR	0.078
Miami, OK	0.078
Panama City-Lynn Haven, FL	0.078
Pascagoula, MS	0.078
Union, SC	0.078
Utica-Rome, NY	0.078
Wheeling, WV-OH	0.078
Whitewater, WI	0.078
Winchester, VA-WV	0.078
Albuquerque, NM	0.077
Beaver Dam, WI	0.077
Claremont, NH	0.077
Elmira, NY	0.077

Greeley, CO	0.077
Las Cruces, NM	0.077
Mayfield, KY	0.077
Monroe, LA	0.077
New Castle, PA	0.077
Prescott, AZ	0.077
Sarasota-Bradenton-Venice, FL	0.077
Syracuse, NY	0.077
Tampa-St. Petersburg-Clearwater, FL	0.077
Watertown-Fort Atkinson, WI	0.077
Augusta-Waterville, ME	0.076
Boise City-Nampa, ID	0.076
Boulder, CO	0.076
Brigham City, UT	0.076
Burlington-South Burlington, VT	0.076
Cadillac, MI	0.076
Daphne-Fairhope, AL	0.076
Harrison, AR	0.076
Houma-Bayou Cane-Thibodaux, LA	0.076
Lawrenceburg, TN	0.076
Lawton, OK	0.076
Morgantown, WV	0.076
Natchez, MS-LA	0.076
Provo-Orem, UT	0.076
Shreveport-Bossier City, LA	0.076
Tucson, AZ	0.076
Bangor, ME	0.075
Bloomington-Normal, IL	0.075
Concord, NH	0.075
Davenport-Moline-Rock Island, IA-IL	0.075
Elizabethtown, KY	0.075
Fond du Lac, WI	0.075
Gadsden, AL	0.075
Laconia, NH	0.075
Orlando, FL	0.075
Peoria, IL	0.075
Tupelo, MS	0.075
Walterboro, SC	0.075
Wichita, KS	0.075
Wilmington, NC	0.075
Flagstaff, AZ	0.074
Jacksonville, FL	0.074
Keene, NH	0.074

Madison, WI	0.074
Montgomery, AL	0.074
Ocala, FL	0.074
Omaha-Council Bluffs, NE-IA	0.074
Reno-Sparks, NV	0.074
Seattle-Tacoma-Bellevue, WA	0.074
Somerset, KY	0.074
Tallahassee, FL	0.074
Alexandria, LA	0.073
Appleton, WI	0.073
Champaign-Urbana, IL	0.073
Charleston-North Charleston, SC	0.073
Cleveland, MS	0.073
Clinton, IA	0.073
Colorado Springs, CO	0.073
De Ridder, LA	0.073
Decatur, IL	0.073
Farmington, NM	0.073
Jackson, MS	0.073
Lakeland, FL Metropolitan Statistical	0.073
Lexington-Fayette, KY	0.073
McAlester, OK	0.073
Medford, OR	0.073
Morgan City, LA	0.073
Rockford, IL	0.073
San Luis Obispo-Paso Robles, CA	0.073
Spokane, WA	0.073
Springfield, IL	0.073
Tuscaloosa, AL	0.073
Brunswick, GA	0.072
Columbus, GA-AL	0.072
Effingham, IL	0.072
Gainesville, FL	0.072
Lebanon, NH-VT	0.072
McAllen-Edinburg-Mission, TX	0.072
Quincy, IL-MO	0.072
Sierra Vista-Douglas, AZ	0.072
Meridian, MS	0.071
Monroe, WI	0.071
Redding, CA	0.071
Vallejo-Fairfleld, CA	0.071
Americus, GA	0.07
Baraboo, WI	0.07

Cape Coral-Fort Myers, FL	0.07
Eugene-Springfield, OR	0.07
Gillette, WY	0.07
Lake City, FL	0.07
Springfield, MO	0.07
Wausau, WI	0.07
Deltona-Daytona Beach-Ormond Beach, FL	0.069
Minneapolis-St. Paul-Bloomington, MN-WI	0.069
Palm Bay-Melbourne-Titusville, FL	0.069
Sebring, FL	0.069
Vicksburg, MS	0.069
Logan, UT-ID	0.068
Naples-Marco Island, FL	0.068
Portland-Vancouver-Beaverton, OR-WA	0.068
Rapid City, SD	0.068
Salinas, CA	0.068
Savannah, GA	0.068
Brownsville-Harlingen, TX	0.067
Carson City, NV	0.067
Cedar Rapids, IA	0.067
Waterloo-Cedar Falls, IA	0.067
Miami-Fort Lauderdale-Miami Beach, FL	0.066
Mountain Home, ID	0.066
Napa, CA	0.066
Port St. Lucie-Fort Pierce, FL	0.066
Santa Cruz-Watsonville, CA	0.066
Clearlake, CA	0.065
Iron Mountain, MI-WI	0.065
Olympia, WA	0.065
Salem, OR	0.065
Duluth, MN-WI	0.064
Gardnerville Ranchos, NV	0.064
Laredo, TX	0.064
Jackson, WY-ID	0.063
Durango, CO	0.061
Fargo, ND-MN	0.061
Santa Rosa-Petaluma, CA	0.061
Ames, IA	0.058
Shelton, WA	0.058
Ukiah, CA	0.058
Bellingham, WA	0.057
Des Moines-West Des Moines, IA	0.057
Lincoln, NE	0.056

Kalispell, MT	0.055
Mount Vernon-Anacortes, WA	0.052
Port Angeles, WA	0.044
Honolulu, HI	0.042

Senator CARPER. Dr. McClellan, thank you very, very much.

Our vote is underway, and Mayor Grace, I want to make sure we get your testimony in before Senator Voinovich and I hot-foot it over to the floor to vote, then we will be back to ask you some questions.

Our final witness here today on this panel is Mayor George L. Grace. I understand you are also something that a lot of my colleagues would like to be, and that is you are also president, in this case not of the United States, but President of the National Conference of Black Mayors. Mayor, Mr. President, wearing both of those hats, you have 5 minutes. I will ask you to use those 5 minutes well. Thanks so much.

STATEMENT OF HON. GEORGE L. GRACE, MAYOR, ST. GABRIEL, LA AND PRESIDENT, NATIONAL CONFERENCE OF BLACK MAYORS

Mr. GRACE. Thank you, Chairman Carper, Senator Voinovich.

As said, I am George L. Grace, and I am Mayor of the city of St. Gabriel, Louisiana, and I am President of the National Conference of Black Mayors.

On behalf of the more than 600 member mayors, I want to thank you for this opportunity to appear before your Subcommittee this morning to share with you our views and concerns regarding the U.S. Environmental Protection Agency's recently announced Notice of Proposed Rulemaking to Review the National Ambient Air Quality Standard for ozone. Mr. Chairman, without objection, I will summarize the main points of my record statement and attempt to respond to any questions you and any other member of the Subcommittee may have.

Senator CARPER. Mayor Grace, your entire statement will be entered into the record. Feel free to summarize.

Mr. GRACE. Thank you.

I would like to begin by making three points. First, the National Conference of Black Mayors supports EPA's regulatory polices that are intended to improve our Nation's air quality in a manner that is cost-effective for our communities and based on sound science. Second, because of such EPA policies, and the coordinated efforts of State and local governments as well as industry, substantial progress has been made over the past 25 years in meeting the Clean Air Act's air quality goals. While more progress is needed in selected areas of the communities across the Country, we should make no mistake that the Clean Air Act is working as intended.

EPA's own data shows that between 1970 and 2006, total emissions of the six principal air pollutants dropped by 54 percent. Last, the National Conference of Black Mayors is deeply concerned about the potential adverse effects on the communities we represent should EPA decide in its final ruling to adopt a more stringent NAAQS standard for ozone.

In specific regards to Louisiana, my understanding is that there are currently five parishes classified as in non-attainment. My parish of Iberville is one of those. Under either proposal being considered, over half of the 64 parishes in the State would be reclassified as in non-attainment for ozone. As I am sure you aware, the designation of a county, or a parish in my case, as in non-attainment

for ozone triggers a second process in which States must develop and submit to EPA a State Implementation Plan that demonstrates compliance within a new standard within a certain timeframe. The emission control strategy required to make such a demonstration will significantly impact the economics of local communities, including jobs and future growth.

Many parishes across our State will for the first time experience the stigma and compliance challenges of being designated non-attainment for ozone. Moreover, these parishes, or counties, that are currently designated as being in non-attainment for ozone would be faced with identifying and implementing even more demanding compliance strategies, even before they have had an opportunity to implement fully the plans on which they are now working to comply with, the present .08 parts per million standard.

The situation in Louisiana is representative of what many other member mayors across the Country will face should the ozone standard be made more stringent. Alabama, for example, currently has only two of the State's 67 counties designated as non-attainment for ozone. This number would increase to over half the State's counties, depending on which new standard is chosen.

Similarly, in Mississippi, up to one-third of the State's 82 counties would become non-attainment, again depending upon which standard is chosen. The impact of being designated non-attainment will also have a disparate impact on those communities undertaking economic revitalization efforts and rebuilding, like those in the Gulf Coast States in the aftermath of Hurricanes Katrina and Rita. Such impacts manifest themselves in the form of increased costs to industry, permitting delays and restrictions on industry, industrial expansion within an area, impacts on transportation planning, increased costs to consumers for commercial and consumer products.

This will result in continuing oversight by EPA at the local level until the area has met and maintained the standard for the required period of years. These aspects have a very real impact on the community.

We can't afford to jeopardize the progress being made in the south as well as the Country as a whole. Thank you very, very much for this opportunity.

[The prepared statement of Mr. Grace follows:]

STATEMENT OF HON. GEORGE L. GRACE, MAYOR, ST. GABRIEL, LA AND PRESIDENT, NATIONAL CONFERENCE OF BLACK MAYORS

Good morning.

I am George l. Grace, mayor, St Gabriel, Louisiana, and president of the National Conference of Black Mayors (NCBM).

Mr. Chairman, on behalf of its more than 600 member mayors, I want to thank you for the opportunity to appear before your subcommittee this morning to share with you our views and concerns regarding the us environmental protection agency's recently announced notice of proposed rulemaking (nprm) to review the National Ambient Air Quality Standard (NAAQS) for ozone.

Mr. Chairman, without objection I will summarize the main points of my record statement and attempt to respond to any questions you or other members of the subcommittee might have.

I would like to begin by making three points.

First, the National Conference of Black Mayors supports EPA regulatory policies that are intended to improve our Nation's air quality in a manner that is cost-effective for our communities and based on sound science.

Second, because of such EPA policies, and the coordinated efforts of State and local Governments and industry, substantial progress has been made over the past 25 years in meeting the clean air act's air quality goals. While more progress is needed in selected areas and communities across the country, we should make no mistake that the clean air act is working as it was intended. EPA's own data show that between 1970 and 2006, total emissions of the six principal air pollutants dropped by 54 percent.

Lastly, the NCBM is, however, deeply concerned about the potential adverse impact on the communities we represent, should EPA decide in its final ruling to adopt a more stringent NAAQS standard for ozone.

In specific regard to Louisiana, my understanding is that currently, there are only 5 parishes classified as non-attainment for ozone. Under either of the proposed new standards under consideration over half of the 64 parishes in the State could be reclassified as non-attainment for ozone.

As I am sure you are aware, the designation of a county (or parish) as non-attainment for ozone triggers a second process in which affected States must develop and submit to EPA a State Implementation Plan (SIP) that demonstrates compliance with the new standard within a certain time frame. The emission control strategies required to make such a demonstration will significantly impact the economies of local communities, including jobs and future growth.

Many parishes across our State will, for the first time experience the stigma and compliance challenges of being designated non-attainment for ozone. Moreover, those parishes that are currently designated as being non-attainment for ozone will be faced with identifying and implementing even more demanding compliance strategies, even before they have had an opportunity to implement fully, the plans on which they are now working to comply with the present 0.08 ppm standard.

The situation in Louisiana is representative of what many of our member mayors across the country will be facing should the ozone standard be made more stringent.

Alabama, for example, currently has only two of the State's 67 counties designated as non-attainment for ozone. This number could increase to over half of the State's counties depending upon which new standard is chosen.

Similarly, in Mississippi, up to one third of the State's 82 counties would become non-attainment, again, depending upon which standard is chosen.

The impact of being designated non-attainment will also have a disparate impact on those communities undertaking economic revitalization efforts and rebuilding, like those in the gulf coast in the aftermath of Katrina. Such impacts manifest themselves in the form of increased costs to industry, permitting delays, restrictions on industrial expansion within an area, impacts on transportation planning, increased costs to consumers and for commercial and consumer products. This results in continuing oversight by EPA at the local level until the area has met and maintained this standard for the required period of years. These aspects have very real impacts on communities.

I have heard some say that at the levels being proposed, attainment and maintenance of the standard will be out of reach for most industrialized States.

We simply cannot afford to jeopardize the progress being made in the south, as well as the country as a whole.

At the National Conference of Black Mayors annual meeting, we adopted unanimously a resolution calling upon EPA to include among its policy options, consideration of retaining the current 0.08 ppm standard. I am providing a copy of that resolution for the record.

In closing, Mr. Chairman, the National Conference of Black Mayors is committed to a clean environment and improved air quality for our communities. However, I'd like to stress that air quality is not the only thing that impacts the health of the people we represent. The health and welfare of our communities is also dependant on having good jobs, economic growth and the quality of life that goes with it.

Accordingly, it is important to have a full and fair discussion of the air quality progress we have achieved to date, and the health and welfare aspects of the economic impacts to our communities.

The National Conference of Black Mayors intends to participate fully in the public comment process associated with EPA's proposed rule. We believe that the current standard should not be made more stringent at this time and will urge EPA to make a realistic assessment of our air quality needs and give careful consideration to the potential adverse impact of a lower standard on our local communities, and the welfare of those who work and live there, including the small and minority-owned businesses that operate and provide services in these areas.

Thank you again, Mr. Chairman.

I will be happy to respond to any questions you might have.

Senator CARPER. Mayor, thank you. The rest of your testimony will be entered into the record.

We are going to recess for about 10 minutes, we are going to run and vote. And we will be way back. While we are away, if the five of you could sort of work out what you think is the consensus position and share that with us, that would just be much appreciated.

[Laughter.]

Senator CARPER. We will see you in about 10 minutes.

[Recess.]

Senator CARPER. I am going to ask our witnesses to take your seats again, please.

Mr. Werner, did you all work things out while Senator Voinovich and I were off voting?

Mr. WERNER. We did. Base it on the science.

[Laughter.]

Senator CARPER. All right. Let me start off, again, my thanks to each of you for your excellent testimony. I want to start off with my first question, I would like to address to Mr. Werner, please. When I was Governor, we were trying to develop a State Implementation Plan. I don't know if you were here in D.C. then or in Missouri in your previous post. But we were trying to retain the current standard. However, much of the pollution in our State didn't come from our State, as you know. Can you just tell us how Delaware has managed to improve our air and to still be on target for reaching attainment by 2010, without shutting down the State's economy?

Mr. WERNER. Absolutely. Not only did we not shut down the economy, we have increased it enormously, probably because the quality of life is something that is valued, and we work on very hard. We have taken a number of creative steps to address the air pollution problem. But as I said, we can't do it alone, but we do our part. There are some of the things that are unique to Delaware. For example, we bring in supertankers off the Atlantic Ocean and lighter them to remove crude oil onto other ships. When that happens, about 2,000 tons a year of volatile organic compounds are contributed to the ozone problem. To control that, we have worked with industry on trying to develop methods for containing the VOCs coming off those lightering vessels.

Another example, we have one of the largest sour crude refineries operating in the United States. It not only emits a huge amount of SOx, but VOCs, and of course, NOx, from boilers and other sources. What we have found is working with them, we could focus our regulatory time tables at a time when they are shutting down equipment anyway for regular maintenance, whether it is the coker or the boilers, so that the control costs are kept low. We find the key is working with industry in identifying ways to keep the costs down and identifying sources where you can obtain cost-effective reductions. Again, we can only do so much. We need more regional and national initiatives to help out.

Senator CARPER. What are some things we could do, we here at the Federal end, to help?

Mr. WERNER. I think your CAPA bill, or "Clean Air Planning Act" goes a long way toward that, the 80 plus percent reduction in SOx, the enormous reductions in NOx, setting tighter caps, allow-

ing for market-based solutions that the Environmental Defense Fund has really promoted as well and has demonstrated would be very effective.

Setting those standards, setting a tighter cap helps. Some more monitoring and modeling assistance, different things, money is needed there that States can't do alone. The Ozone Transport Commission, OTC, has been an enormously valuable partner in that. But they can't do all the modeling without more EPA funding assistance.

Last, some of the federally mandated sources, like mobile sources, more has to be done there. Of course, as I mentioned before, some out of the box things, land use planning, smart growth. There used to be a major effort in the Federal Government to provide technical assistance on smart growth that will help with reducing mobile source emissions. Some more support for those things as well.

Senator CARPER. Thank you.

Dr. Bell, I want to go back to some of the testimony that Dr. McClellan presented. I would just ask, where do you agree with him and where do you disagree?

Ms. BELL. I disagree with the written testimony's interpretation of my work. And I——

Senator CARPER. In what respect?

Ms. BELL. Excuse me?

Senator CARPER. Could you elaborate on that?

Ms. BELL. I believe that the relationship between ozone and mortality has been demonstrated by numerous studies and that the evidence is compelling and overwhelming. There is my own study, which is a national U.S. study, there is also a study on 23 European cities, a study from Harvard University, studies from New York University School of Medicine and many other studies I could list today that show that this relationship stands up to a variety of statistical techniques, a variety of study locations as well.

So I disagree with his interpretation that the scientific evidence on mortality and ozone is not compelling.

Senator CARPER. Are there other parts of his testimony with which you agree or disagree that you would like to share?

Ms. BELL. Well, he spent a good deal of his testimony both in the oral portion and the written portion talking about the difference between the 24 hour exposure metric and the 8 hour exposure metric. I agree that both of these exposure metrics have been used in a variety of studies. In fact, if you look historically at the human health literature, the changing nature of what exposure metric has been used reflects expanding scientific knowledge about the way in which ozone impacts human health.

The 24 hour ozone levels are very highly related to the 8 hour ozone levels, and by that I mean that on days when the 24 hour level is high, the 8 hour level is typically high. So while some studies have provided the 8 hour standard, 8 hour metric time, and some studies have provided the 24 hour metric time. In my own study in the Journal of the American Medical Association, I provided both relevant measures.

But all of these different types of studies using this range of exposure times are very, very relevant to our understanding of ozone

and human health, not just the ones based on the 8 hour standard, excuse me, 8 hour metric time.

Senator CARPER. Mr. Werner, you were nodding your head as Dr. Bell was speaking. We didn't get that on the record.

[Laughter.]

Senator CARPER. What was that head nod about?

Mr. WERNER. Just briefly, studying toxicology in the 1970's as an undergraduate and then later in grad school at Johns Hopkins, the science has been pointing to exactly what Dr. Bell said for quite some time. It is just frustrating to be a practitioner, being the bureaucrat, who has to sit down toe to toe with these industries and hear them complain about the standard. I am sorry, the science has pointed that direction for some time. The policy, has lagged behind for too long a time. Maybe I am just an impatient person, I just want to see that the science and the policy get bridged.

Senator CARPER. All right, good. Dr. McClellan, a rebuttal, a comment?

Mr. MCCLELLAN. I would agree that as the science has evolved over time we have used a variety of metrics. But the very important point to keep in mind is that when we set the standard, it is a precise numeric standard and it is set for a precise averaging time. Thus, while there is a correlation between ozone exposure coefficients developed with 24 hours averaging time daily versus an 8 hour averaging time, there is considerable city to city variation. That has to be acknowledged. And in the end, the policy judgment is one that has to be based on the 8 hour averaging time, unless Dr. Bell or others would like to propose that we move to a 24 hour averaging time as standard. Obviously, the numerical level selected for a 24 hour averaging time standard would be quite different than one selected for an 8 hour averaging time standard.

It is important to keep in mind, that we have been talking here about the possibility of a change from 0.08 ppm down to 0.07. That is a very small change. One shouldn't casually slip from talking about that change in an 8 hour averaging time and then use data that is for 24 hours or for 1 hour averaging times to justify reduction. It has to be done in a very careful, structured way. Unfortunately that was not done in EPA's risk assessment.

Senator CARPER. All right, thank you.

Mayor Grace, in your testimony, you spoke really about the threat to the economy, threat to job creation and job preservation in your town and other towns whose mayors are members of your national association. I fully appreciate the need for jobs. We could have perfectly clean air and have no jobs and all is not well.

Talk to us a little bit, if you would, there is another side to this coin, as you know. The coin that you have addressed is the coin that says, we need jobs, we need to make sure we have a strong and vibrant economy. How do we balance that with the fact that we do have a lot of people who suffer from asthma and other chronic diseases that are related to the quality of the air that we breathe. How do we balance those two?

Mr. GRACE. Let me just say, in my area, which is the Baton Rouge area, and we are in a non-attainment posture at this time, but I have lived in that area all my life. I have seen the quality of air evolve from where it used to be to where it is now. I also

see, as Mayor of the city, and I am familiar with other mayors in that area, I have seen the effort that has been made by EPA and by industry as well as local government. Things are improving just tremendously. I can, just by living there, I can tell the difference.

What I am simply saying is, we have had a lot of work that has been done and that is being done. A lot of these industries in my area, I have 12 petrochemical plants within the confines of the city of St. Gabriel. These people are working very hard to attain the level of 0.08 parts per million. And I think it would be disruptive and maybe a little premature to start moving drastically in another direction.

Also, we have plants that want to expand and they are sort of on hold. They are having to choose whether they want to actually make an investment in my city or in my area, or move their operations abroad. These kinds of things are very much of a concern to our citizens in that area. We are talking about reformulated gasoline, we are talking about a whole lot of things as being very disruptive. And the investment capital that I think we would get by virtue of the fact that we have a lot to offer, the Mississippi River and other available land and things like that, is mitigated by the fact that we have some uncertainty as it relates to the ozone levels.

Senator CARPER. Thank you, sir. Part of Mayor Grace's testimony, on page three, I will just read one sentence. It says, many parishes across our State will for the first time experience the stigma, this is if the standard is strengthened——

Mr. GRACE. Correct.

Senator CARPER [continuing].—will experience the stigma and compliance challenges of being designated non-attainment for ozone. And I would say as a former Governor, now a Senator of a State whose all three counties are in non-attainment, there are worse things than being in non-attainment. You don't want to be there forever. But among the worse things are having kids, older people, especially, not being able to breathe the air and they suffer health problems because of that. Our challenge, and I think it is the challenge that the EPA Administrator faces is, he is required under law to figure out what is the science and what do we need to do for health.

Our challenge, we happen to be the mayor, we happen to be Governor, we happen to be somebody who is in charge of economic development in your State, in charge of environmental controls in your State, Senator, our job is to figure out how we can work together so we can maybe not have it all, but come pretty close, and having it all being a strong, vibrant economy and improving health and improving air quality so we can reduce our health problems.

I have a question, if I could, for Ms. Patton. I believe you, along with Administrator Johnson, and several others of our witnesses today have talked about how the Clean Air Act has already achieved significant reductions in air pollution. Many claim that taking this next step will only hurt the economy and it is not necessary. Mayor Grace in his testimony has alluded to that. Let me just ask, what is your response to these concerns?

Ms. PATTON. Senator Carper, I am not aware of any circumstance where EPA has been confronted with such clear and convincing science. I think that is embodied in the recommenda-

tions of the Clean Air Scientific Advisory Committee. The Nation's Ambient Air Quality Standards have been revised a number of times since the inception of the modern Clean Air Act in 1970. The particulate matter health standard has been revised on four occasions, including most recently in September 2006. The ozone health standard was originally established in 1971, revised in 1979, then again in 1997. Ultimately, there will be a decision made on March 12th of 2008.

In each instance, the Administrator of EPA was entrusted with looking at this body of science and making a decision to set a standard that is requisite to protect public health with an adequate margin of safety. This is a very unusual circumstance, where 1,700 studies since the standard was last reviewed tell us clearly and convincingly that we need to substantially reduce the Nation's health standard to protect the public health against this very serious range of impacts that were documented in this CASAC letter and in the volumes of materials that underlie it.

Senator Boxer said when we were last confronted with these similar arguments, and the Nation reviewed the adequacy of the health standard in 1997 for ozone and particulate pollution that this is a familiar argument. The decision to tighten the Nation's health standards are always met with claims of economic demise. Then technology catches up, we deploy innovative solutions. The science only confirms what we thought in terms of the public health impacts. And everyone breathes cleaner air.

Senator Carper, what you described was a world in which we don't look at a non-attainment map and shrink from that challenge. You described a world in which we stand up. And we take that challenge on. And in fact, there is a third map that was not presented today that shows that in 2020, based on the emissions standards on the books and under consideration right now at the Environmental Protection Agency, that over 60 percent of the areas on the second map that would be affected by a .070 standard would come into compliance in 2020.

So we have this great American success story where we have met the challenge. And we must accept it. And we can in fact protect human health with an adequate margin of safety.

Senator CARPER. All right, thank you. As we come to a conclusion here, I would simply add, there is plenty of work here for all of us to do. That includes the folks who are privileged to sit in the seats that I am now sitting in, and folks back home in our State and local governments, and folks that are working in universities to invent new technologies like those plug-in hybrids and those lithium ion batteries that will enable us to build a Chevrolet product or a Ford product or Chrysler product or other product that will help us to clean our air and reduce our dependence on foreign oil at the same time.

In our jobs, we get to sit through a lot of hearings. And it is rarely that I sit through a hearing and walk away and say, well, that wasn't much help. That is rare that happens. Having said that, this has been an extraordinarily helpful hearing, uncommonly helpful hearing. I am encouraged, walking away from here, that next March 12th, the Administrator is going to make a decision and announcement that is not going to be wildly cheered by everyone, but

most people will say that was the right thing to do, and it keeps us moving in the right direction. Then the obligation falls on the rest of us to make sure if we do have that more rigorous standard that we cannot just meet it, but also meet it in a way that enables us to continue to grow our economy and to meet those needs of our people, whether they happen to be down there in Alabama or up in Delaware or any other place in our Country.

You all could have been some place else today, and we are just very grateful that you are here. And to each of you for the work that you do and the stewardship that you provide for folks, whether it is in a State or a town, thank you for that.

Connor, young man, we are delighted that you took a day off. You could have been at the beach some place, you could have been at the beach in Delaware today having a good time. But we are glad you came here today and we are glad you brought your grandfather with you. I thought he did a nice job, and I hope that you are pleased as well.

With that having been said, we will close this hearing. Some of our Senators are going to be submitting additional questions for you to answer. I would appreciate if you would do that, and that would become part of the record.

Senator CARPER. I would ask that you complete the answers to those questions for the record promptly, if you will, so we can publish our hearing. We try to do that in a timely fashion.

Again, thank you all for coming. We wish you a good week and better air quality, wherever you are headed. God bless you. Thank you so much.

This hearing is adjourned.

[Whereupon, at 12:25 p.m., the committee was adjourned.]

Review of EPA's Proposed Revision to the Ozone NAAQS

Statement of the American Road and Transportation Builders Association

Submitted to the United States Senate Committee on Environment and Public Works Subcommittee on Clean Air and Nuclear Safety

June 11, 2007

On behalf of the American Road and Transportation Builders Association (ARTBA) and its 5,000 member firms and public agencies nationwide, the association would like to thank Chairwoman Boxer, Ranking Member Inhofe, Subcommittee Chairman Carper and Subcommittee Ranking member Voinovich for reviewing the United States Environmental Protection Agency's (EPA's) recently proposed revision to the National Ambient Air Quality Standards (NAAQS) for ozone.

ARTBA's membership own, plan, design, supply and construct transportation projects throughout the country which are directly impacted by the federal Clean Air Act (CAA) and EPA's ozone NAAQS. Federal transportation funding for projects built by ARTBA members is contingent upon conformity with the CAA and its ozone standards. The industry we represent generates more than $200 billion annually in U.S. economic activity and sustains more than 2.5 million American jobs. This statement represents the collective view of our member companies and organizations.

The EPA's proposed recommendation, announced June 21, would tighten the federal ozone standard from 0.08 parts per million (ppm) to a level between 0.075-ppm and 0.070-ppm. Any tightening of the ozone standard would increase the number of counties that do not comply with CAA standards. As a result, federal highway funds can be withheld from these communities. This reality creates a counterproductive cycle where new NAAQS standards delay critically needed improvements to the nation's infrastructure network which has already reached "critical mass" in terms of being able to serve the needs of our citizens and economy. In many cases, the projects put on hold or cancelled would have alleviated traffic congestion that is a major cause of mobile source emissions. As such, ARTBA strongly believes recent recommendations to tighten

ozone standards ignore the public health and welfare of those citizens in areas where transportation improvement projects will be jeopardized.

When considering ozone standards, and any possible changes, it is important to note the EPA's own reports have indicated an overall decline in ozone emissions. As EPA reported April 30: "between 1970 and 2006, gross domestic product increased 203 percent, vehicle miles traveled increased 177 percent, energy consumption increased 49 percent, and U.S. population grew by 46 percent. During the same time period, total emissions of the six principal air pollutants dropped by 54 percent." Specifically, there has been a decline in the overall concentration level of criteria pollutants for one-hour ozone concentrations of 29 percent and for eight-hour ozone concentrations of 21 percent in the past 26 years[1]. This progress has occurred both prior to and since the implementation of the existing ozone NAAQS. Furthermore, this continuing improvement indicates the current regulations are having their desired effect.

Ground level ozone (as opposed to the ozone in the upper atmosphere or "ozone layer," which occurs naturally) is formed by the combination of the oxides of nitrogen (NOx) and volatile organic compounds (VOCs) in sunlight. NOx and VOCs are referred to as the "criteria pollutants" for ozone. As levels of NOx and VOCs decline, so will the amount of harmful ground level ozone. Since 1970, NOx levels have decreased by 33 percent and VOC levels have decreased by 55 percent[2]. This decline in pollution is being heavily driven by improvements in the transportation sector. Specifically, NOx emissions from motor vehicle emissions have gone down 41 percent since 1970, while VOC emissions from motor vehicles have declined by 73 percent.

Today's average motor vehicle produces 80 to 90 percent less emissions than it did in 1967.[3] Clearly, the transportation community is playing a vital role in reducing ozone levels and is continuing to take steps, independent of the NAAQS, to build on this success by further reducing all forms of air pollution. As better motor vehicle and fuel technologies develop, vehicle emissions will continue to go down with increased automobile usage.

Illustrating this point, major automobile manufacturers announced in 2005 a new generation of vehicles that will be 99 percent cleaner than vehicles produced 30 years ago. This reduction in emissions comes from a four-part strategy that includes cleaning up the fuel as it goes into the vehicle, burning the fuel more precisely in the engine, removing undesirable emissions with a catalyst, and monitoring all of these systems to ensure minimal emission levels. As these and other new technologies are integrated into both on and off road vehicles, emissions levels in all areas (including ozone) should continue to decline.

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[1] United States Environmental Protection Agency, National Trends in Ozone Levels, Ozone Air Quality 1980-2006, available at http://www.epa.gov/air/airtrends/econ-emissions.html.

[2] U.S. EPA, Air Emissions Trends – Continued Progress through 2005, available at: http://www.epa.gov/air/airtrends/econ-emissions.html. The six principal or "criteria" air pollutants referred to by the EPA are nitrogen dioxide, ozone, sulfur dioxide, particulate matter, carbon monoxide and lead.

[3] United States Department of Transportation, "Transportation Air Quality Selected Facts and Figures." (1999).

Further, any proposal to tighten ozone standards must consider reductions in ozone levels will occur as a direct result of existing regulations yet to take effect. Dramatic improvements in ozone levels will come beginning this year from implementation of recently enacted regulations on sulfur levels in gasoline, as well as measures affecting heavy-duty diesel engines and highway vehicles. In fact, regulations took effect in 2006 requiring refiners to meet a 30-ppm average sulfur level for gasoline with a cap of 80-ppm. This fuel will enable vehicles to use emissions controls which are projected to reduce tailpipe emissions of NOx by 77 percent from passenger cars and as much as 95 percent for pickup trucks, vans and sports utility vehicles. When fully implemented, these regulations are expected to have the effect of removing 164 million cars from our nation's roadways.[4]

In addition, EPA also will continue implementation of its rule to make heavy-duty trucks and buses run cleaner. Beginning with the current model year, pollution from heavy-duty highway vehicles will be reduced by more than 90 percent[5], resulting in an additional reduction in NOx levels of 2.6 million tons per year. Further, EPA will begin implementation this year of its rule to regulate emissions from nonroad diesel engines by integrating engine and fuel controls as a system to gain the greatest emission reductions. Engine manufacturers are expected to produce engines with advanced emission-control technologies similar to those upcoming for highway trucks and buses. Exhaust emissions from these engines are estimated to decrease by more than 90 percent.[6] This is estimated to result in an additional reduction of 738 thousand tons of NOx per year.

Thus, there are currently four different regulatory efforts underway, all of which aim to result in significant ozone reduction.

The revisions to the ozone NAAQS recommended by EPA would greatly increase the stringency of the ozone regulation at a time when implementation of existing standards is already resulting in noticeable progress. According to the EPA, currently, 104 of the 639 counties monitored for ozone levels are out of compliance. Tightening the current standard to the EPA's recommended levels would increase the number of noncompliant counties to anywhere between 398 (at a level of 0.075-ppm) and 523 (at a level of 0.070-ppm), a potential increase of 500 percent.

Currently counties are focusing on implementing existing ozone standards and any further changes to the standards will undermine these efforts. Counties need some sense of predictability in order to develop long-range transportation plans to achieve ozone reduction. If counties are to effectively comply with current standards, additional requirements will only serve to hamper these efforts by opening the door to possible litigation and sanctions potentially resulting in the loss of federal funding for transportation improvement projects.
In addition to the aforementioned increases in VMT and population, Federal Highway Administration data shows substantial increases overall numbers of motor vehicles (58 percent) and licensed drivers (41 percent) since 1980. During this same time period, the number of lane

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[4] United States Federal Highway Administration, *Transportation Air Quality Selected Facts and Figures*, p. 36 (2006).
[5] EPA Heavy Duty Highway Diesel Program, information available at http://www.epa.gov/otaq/highway-diesel/index.htm.
[6] EPA Clean Air Nonroad Diesel Rule, information available at http://www.epa.gov/nonroad-diesel/2004fr/420f04032.htm.

miles in the United States has only increased by six percent. The nation's road system is not keeping up with an ever growing congestion problem. Jeopardizing transportation funding in new areas through implementation of the EPA's recommendations is self-defeating and would exacerbate this problem by imposing new obstacles for needed transportation improvements that can cut both harmful emissions and billions of dollars in wasted motor fuel caused by traffic congestion.

Section 109 of the Clean Air Act directs the EPA to promulgate standards for pollutants "requisite to protect the public health." This is a commendable objective and one shared by ARTBA. EPA, however, must be cognizant of the impact more stringent ozone standards would have on other federal initiatives. Over 43,000 people die on U.S. highways each year and many federally-funded highway improvements are designed specifically to address safety issues. As such, imposing new ozone standards that lead to highway improvements being denied could have an adverse effect on public health.

Rather than face the prospect of transitioning to these newer standards, it is more appropriate to provide state and local entities the time and flexibility needed to implement already existing ozone standards. Accordingly, EPA should focus on helping counties meet existing ozone standards and avoid developing new proposals until it knows the full effect of the current standards. EPA's proposal does allow for the option of retaining the current ozone NAAQS, as opposed to adopting more stringent standards. ARTBA strongly urges the Committee to support the retention of the current ozone NAAQS.

In conclusion, ARTBA asks the Committee to recognize the shared goals of transportation and environmental policy and their interrelatedness. The implementation of EPA's recommended ozone standards will hamper the nation's abilities to both preserve and improve its transportation infrastructure. The retention of the current ozone standards will, on the other hand, allow the nation to continue to make progress towards cleaner air while at the same time continue to pursue desperately needed transportation improvements vital to our economy, public health and safety. ARTBA looks forward to working with the Committee to achieve a cleaner environment through the continuation of proven technological and regulatory efforts.

PUBLIC COMMENT TO CASAC OZONE REVIEW PANEL MARCH 5 2007

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I am a professor of statistics at the University of North Carolina, Chapel Hill. My research interests include the epidemiology of particulate matter and ozone. My recent research sponsors include NSF, NOAA, NIEHS and the American Petroleum Institute. However the comments that follow are my own personal opinions and do not represent the views of the University of North Carolina or any of my research sponsors.

My comments relate to the ozone chamber experiments of Adams (2006) and earlier related papers. These experiments have characterized the effect on lung function (measured by FEV_1 decrement) of 6.6-hour exposure to ozone at a variety of levels (filtered air, 0.04 ppm, 0.06 ppm, 0.08 ppm, ...) and two concentration patterns (square and triangular) (see pages 3–6 to 3–9 and 5–18 to 5–28 of the staff paper). I have two major comments to make:

Point 1. Adams (2006) found a significant effect of ozone on FEV_1 decrement at 0.08 ppm ozone, but not at 0.06 ppm. The staff paper criticizes Adams' use of a Scheffé multiple comparisons procedure and provides an alternative analysis that does show an effect at 0.06 ppm. However, Adams' analysis was designed to protect against possibly spurious effects being detected when comparing many experiments simultaneously. When this aspect is taken into account, the evidence for a response at 0.06 ppm ozone level is still very uncertain.

The attached table shows all possible pairwise t-test comparisons among the Adams experiments (including one from Adams (2002), using a different cohort, for the 0.04 ppm square wave experiment). The table shows the mean decrement in FEV_1 for each comparison, with asterisks denoting the level of statistical significance.

In making policy-relevant comparisons, those with 0.04 ppm ozone level are more relevant than those with filtered air, which does not represent a realistic background level. However, of the four possible comparisons between 0.04 ppm and 0.06 ppm, only two of them are statistically significant, and the mean FEV_1 decrement is less than half the corresponding mean at 0.08 ppm ozone level.

In my judgment, when all the comparisons are taken into account, there is insufficient evidence to conclude that there is any well-defined response to ozone exposure below the 0.08 ppm level.

Point 2. The second type of comparison based on the Adams experiments is for the proportion of individuals who show an FEV_1 decrement greater than 10%. See in particular, Fig. 5.2(a) on page 5–24, which plots the dose-response curve and associated confidence limits. From visual inspection of that curve, it looks as though a 95% confidence interval for the response at 0.06 ppm ozone is between roughly 6% and 16%.

However, the actual experiment shows that at 0.06 ppm ozone exposure (either triangular or square wave), the number of individuals with FEV_1 decrement greater than 10% was 2 out of 30 test subjects. This is an extremely small number of individuals from which to conclude that the

response is significant. A direct 95% confidence interval calculation (see Appendix) is that the proportion in the general population who would show a 10% FEV_1 decrement at an ozone level of 0.06 ppm is between 0.8% and 22%. This is quite different from the impression created by Fig. 5.2(a), and indicative of a much higher level of uncertainty.

The staff paper response curve is based on combining data from several ozone levels using a logistic response curve, but this assumes that the response curve fitted to higher ozone levels can be extrapolated downwards to 0.06 ppm. Given the large uncertainty in the probability of response at 0.06 ppm ozone, I do not believe the staff paper's conclusions on this point are justified.

References

Adams, W.C. (2002), Comparison of chamber and face mask 6.6-hour exposures to ozone on pulmonary function and symptoms responses. Inhalation Toxicology **14**, 745–764.

Adams, W.C. (2006), Comparison of chamber 6.6-h exposure to 0.04-0.08 ozone via square wave and triangular profiles on pulmonary responses. Inhalation Toxicology **18**, 127–136.

First exposure pattern	Second exposure pattern					
	.04 triang.	.04 square	.06 triang.	.06 square	.08 square	.08 triang.
Filter	0.002	0.012	0.028**	0.029***	0.061***	0.070***
.04 triangular		0.011	0.026*	0.027***	0.059***	0.068***
.04 square			0.015	0.016	0.048**	0.058***
.06 triangular				0.001	0.033*	0.042***
.06 square					0.032	0.041*
.08 square						0.009

Tabulated is the mean decrement in FEV1 when moving from the first exposure pattern to the second exposure pattern.

* indicates a statistically significant effect at $\alpha = .05$.
** indicates a statistically significant effect at $\alpha = .01$.
*** indicates a statistically significant effect at $\alpha = .001$.

All comparisons based on pairwise t tests. Tests based on exposure .04 (square wave) calculated by combining data from the two Adams papers (2002, 2006): within each sample, the mean FEV1 decrement was calculated between the exposure of interest and the filtered air control; the difference between those means was used to construct the test.

Appendix: Confidence interval calculation

The standard textbook calculation of the confidence interval for a binomial parameter is based on the normal approximation and leads to the interval $\hat{p} \pm 1.96\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ where $\hat{p} = \frac{X}{n}$ is the sample proportion (n is the sample size, X is the observed number of responses). However in this case with $n = 30$, $X = 2$, this would lead to the absurd confidence interval $(-.023, .156)$. The reason for the failure is that the normal distribution is not applicable for such small n and p.

So we proceed with an exact calculation, as follows. We make use of the following equivalence principle between tests and confidence intervals: a 95% confidence interval for p consists of all values of p_0 for which a test of the hypothesis $H_0 : \ p = p_0$ against the alterative $H_1 : \ p \neq p_0$ would *not* be rejected at significance level .05.

A two-sided, equal tailed test would reject H_0 when $X = x$ if $x \leq x_L$ or $x \geq x_U$ where the lower and upper bounds x_L, x_U satisfy

$$\Pr\{X \leq x_L \mid p = p_0\} \ \leq .025, \quad \Pr\{X \geq x_U \mid p = p_0\} \ \leq .025.$$

Therefore, we reject when $x = 2$ if and only if

$$\Pr\{X \leq 2 \mid p = p_0\} \ \leq .025 \text{ or } \Pr\{X \geq 2 \mid p = p_0\} \ \leq .025.$$

But based on $n = 30$, $\Pr\{X \leq 2\} = (1-p)^{30} + 30p(1-p)^{29} + 435p^2(1-p)^{28}$ and $\Pr\{X \geq 2\} = 1-(1-p)^{30} - 30p(1-p)^{29}$. By solving, respectively, $(1-p)^{30} + 30p(1-p)^{29} + 435p^2(1-p)^{28} = .025$ for the upper bound (solution: $p = .22073$) and $(1-p)^{30} + 30p(1-p)^{29} = .975$ for the lower bound (solution: $p = .00818$), we find the confidence interval as stated.

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