

## **PARTICULATE MATTER:**

### **THE PROPOSED STANDARD AND HOW IT MAY AFFECT NEW JERSEY**

#### **SCOPE**

The 1997 New Jersey Clean Air Council (Council) Public Hearing sought information on issues relating to the November 27, 1996 U.S. Environmental Protection Agency (EPA) proposed new health standard for fine particulate matter (PM). The proposed new standard addresses fine particulate matter of 2.5 micrograms or less (PM 2.5). The current health standard includes coarse particles of 10 micrograms or less.

The hearing included testimony on the sources of fine particulates in New Jersey, the role of long-range transport and the health benefits attributed to the new standard. The forum also explored the fact that research data is inconclusive as to the chemical characterization and source apportionment of PM 2.5.

#### **BACKGROUND**

The Federal Clean Air Act directs the EPA to identify and set standards for pollutants which impact public health and the environment. EPA is required to review the health standard at least once every five years. In November 1996, after receiving the recommendations of the Clean Air Scientific Advisory Council (CASAC), the EPA concluded that the PM 10 standard was not fully protective of public health. (See Appendix A) The EPA cited increased premature deaths, aggravation of respiration and cardiovascular illnesses, lung function effects, changes to lung structure and defense mechanisms. Other effects include decreased visibility, soiling and materials change.

There are significant differences between PM 10 and PM 2.5. These particulates are generated by different mechanisms, have distinctly different compositions and are deposited differently. Coarse particles are generated by mechanical mechanisms, they have a short atmospheric lifetime and are often largely composed of soil and dust.

Knowledge of the makeup of fine particles in the air is incomplete. One source is diesel emissions and another source is soil and dust. It is also known that a significant part of fine particulates comes from secondary aerosol, particles that are not directly emitted to the air but form from emissions of gaseous pollutants, such as sulfur dioxide (SO<sub>x</sub>) and nitrogen oxides (NO<sub>x</sub>). These particles take time to form and can be transported long distances, hundreds of miles or more. Emissions from coal power plants are major sources of SO<sub>x</sub> and NO<sub>x</sub> pollution. Some control of SO<sub>x</sub> pollution will be accomplished by the programs already adopted to stem acid rain. The effort to reduce ground level ozone will reduce emissions of NO<sub>x</sub> thereby cutting the level of nitrate particles. However, cooperation among the states in controlling these emissions will be necessary.

In addition to the complex make-up of fine particles, there are large uncertainties as to the appropriate level of a PM 2.5 standard. The proposed standard is the level required to reduce premature deaths by 50 % according to epidemiological data, but the uncertainties in this number are large. Toxicological studies have been unable to identify a plausible biological mechanism to explain the epidemiological findings, there is little evidence of threshold, no understanding regarding the degree of life shortening, and the susceptible population is poorly defined.

Control of PM 2.5 will require regional planning and control of gas-phase precursors. For these reasons, chemical characterization and source apportionment activities will be important to the development of an effective air quality management plan.

#### **RECOMMENDATIONS**

\* The Council strongly supports New Jersey's promulgated rules requiring the inspection and maintenance of heavy duty diesel powered vehicles. This program should begin now and should be incorporated into the State Implementation Plan (SIP). (Proposed Amendments: N.J.A.C. 7:27 -14 and 7:27B-4)

- \* The Council continues to support full implementation of the enhanced I/M (inspection and maintenance) program for automobiles. (N.J.A.C. 7:27-15)
- \* The Council recommends future regional fine particulate mapping for incorporation into the current television ozone mapping program. The council believes that fine particulate matter reporting is an important part of public education.
- \* Studies have shown that a significant part of total particulate matter is formed from the emissions of gaseous pollutants, such as sulfur dioxide and nitrogen oxides. Such particulate matter takes time to form, and can thus be transported long distances in the atmosphere. It is therefore necessary to work with other states, both neighboring and more remote, to address the transport problem.
- \* The Council applauds the Ozone Transport Assessment Group (OTAG), for its activities in developing consensus for the control of emissions from coal-fired power plants. The Council proposes that a similar regional interstate group be formed to plan for regional control of fine particulate matter. The Council recognizes the importance of implementation and enforcement of regional strategies for control of interstate transport of fine particulates and of NOx.
- \* The Council recommends ongoing research into the health effects of fine particulate matter emissions.
- \* The Council advocates continued research into the chemical characterization and source apportionment of PM 2.5. Such research is essential to the development of an effective air quality management plan.
- \* Prior to implementation of a SIP for fine particulates, the Council recommends careful social and economic research into the impact on residents and businesses in New Jersey.
- \* The Council recommends the development of a reliable standard reference monitoring method needed to determine compliance. Regional monitoring of fine particulate matter through appropriate siting of the monitoring stations and proper equipment installation should proceed based on a standard reference method.
- \* The Council continues to support the establishment of a comprehensive statewide public education program aimed at increasing the public's understanding of air pollution and the action needed to correct the problem. This program needs to include information on the sources of particulates and the public's role in curbing them.
- \* The Council recommends that as an important part of public education there be increased emphasis on educating school children on environmental matters, especially the sources of particulate matter in air pollution.
- \* The Council realizes that indoor air quality is not specifically part of the National Ambient Air Quality Standards (NAAQS). Nevertheless, the Council would like to understand the relative roles of an individual's exposure to outdoor and to indoor levels of PM and the Council recommends research into the significance of these levels in respect to public health.

## SUMMARIES OF TESTIMONY

### **LEWIS NAGY - POLICY AND PLANNING, ASSISTANT COMMISSIONER, DEP**

The standard that EPA is proposing for fine particulates is based on health studies which link an increased incidence of both respiratory problems and mortality rates to elevated levels of fine particulates in the air. Proponents believe that because of the severity of the health

effects, we need to act now to control the problem. Opponents find the evidence insufficient and inconclusive. They believe adopting new standards is too costly. Attaining the new standard in New Jersey

could mean improved quality of life for the State, but it could also put some industries at a severe economic disadvantage by costing millions.

New Jersey meets the current air quality standards for particulates (PM 10), but probably will not meet the new standard (PM 2.5). The State will have to develop a plan to meet the

standard. We know that a significant part of the total amount of fine particulates in New Jersey comes from secondary aerosols, particulates that are not directly emitted, but are formed from

gaseous emissions, such as SO<sub>x</sub> and NO<sub>x</sub>. Diesel emissions are another source and that will be addressed by the inspection and maintenance of heavy duty diesel powered vehicles will begin next year. The proposed standard for fine particulates will pose many challenges for New Jersey.

### **RAYMOND WERNER - EPA REGION 2**

EPA is due to make a decision on the particulate standard on July 19, 1997. We have already received over 17,000 comments on this new standard.

The Clean Air Act requires the administrator to establish national ambient air quality standards in order to protect the public health and to prevent damage to crops, materials and visibility. We have these standards for six pollutants right now: carbon monoxide, PM 10, ozone, lead, NO<sub>x</sub> and SO<sub>x</sub>. We are required to revisit these standards every five years. We last evaluated PM 10 in 1987. EPA focused on PM 10 in the 1980s because it was known that those particles had the ability to penetrate the lungs.

In setting the standard, cost is not a factor. But, the best scientific data should be considered and EPA does not collect this data. Universities and medical institutions do that. EPA looks at the data published in medical journals and the like and from this body of information, EPA develops a criteria document.

Congress set up the Clean Air Scientific Advisory Council (CASAC). It is made up of experts from industry, academia, government and the medical sector. EPA's criteria document is reviewed officially by this body. They decide whether or not EPA has an adequate data base for setting the standard. Then, EPA proposes the standard and receives public comment on the new standard.

For particulate matter the EPA identified about 80 key epidemiological studies. Sixty of those studies found a link between particulate matter levels and health problems. 19 of the 21 CASAC members recommended revising the standard to PM 2.5.

There is a difference between the size of the particle and concentration. The concentration standard for PM 10 is fifty micrograms, the standard for PM 2.5 is 15 micrograms on an annual basis. In calculating PM 2.5 spatial averaging also would be used.

There is a certain amount of scientific uncertainty involved with the new standard. There are also many details to work out. Decisions need to be made concerning areas of attainment and non-attainment, determination of upwind and downwind states' contribution to particulates and time limits on compliance plans.

If a new standard is adopted, monitoring techniques and a monitoring plan must also be developed. The placement of monitors, the core areas for monitoring, frequency of monitoring all needs to be worked out. The first monitor will not be in the field until January 1998.

Collection will take place over a three year period. The attainment date will be five years from the designation of the standard. State Implementation Plans (SIPs), clean air plans will be due

in the year 2002. There will also be two one-year extensions so that it could be 12 years or more before the standard is enforced. The time frame for meeting these standards goes well into the next century.

No full cost benefit analysis has been done, but it is estimated that there will be a net

benefit of fifty billion to over a hundred billion dollars in savings when the new standard is implemented. There will be tens of thousands of fewer deaths per year, sixty thousand fewer

cases of chronic bronchitis. Visibility will improve through the removal of the regional haze effect.

**GEORGE WOLFE -General Motors Corporation, Scientist and Former Chairman CASAC**

I was chairman of CASAC during the time when the reviews for the PM and ozone standard were being reviewed. For the PM review CASAC was made up of 21 scientific experts on air pollution.

PM 2.5 is a separate pollutant because it comes from different sources. It comes from combustion and secondary reactions. It also comes from wind-blown dust, grinding sanding and the buffalo effect. There are many health effect studies, but the process was driven by the epidemiology studies that linked mortality to PM.

Although there was concern about setting the PM 2.5 standard, there was absolutely no consensus on the level of the standard. Five members supported a fifty microgram per cubic meter standard for 24 hours, four members supported greater than or equal to sixty-five to seventy-five micrograms and four members did not support a 24 hour standard at all. Eight members said yes to the concept, but did not endorse a range. For the annual standard, two members supported 15 micrograms, two members 20 micrograms and two members recommended 25-30 micrograms. Eight members said no to the annual standard and six said yes in concept but did not endorse a value.

The question must be asked, "Why this diversity of opinion?" One of the reasons was that the Court-ordered review did not allow enough time for these complex issues to be discussed and the second reason was that there are unanswered questions and uncertainties concerning PM 2.5. The case for PM 2.5 is not established. The studies are not conclusive that the health effects are really caused by PM 2.5. Mark Yetel, a notable chest physician on the CASAC, claims that there is no biological mechanism to explain how PM is killing people. We don't know if there is a threshold and the methods we use can not detect it.

The National Institute for Statistical Sciences in North Carolina has done two re-analyses so far and they conclude that the studies are statistical artifacts. Causality has not been established. There is no consensus on the level or range of interaction. At this point a standard cannot be chosen based on the underlying science.

I favor a target research program over the next five years. I recommend using that research to make a decision.

**PAUL LIOY - Environmental and Occupational Health Sciences Institute (EOHSI) and EPA Science Advisory Board**

The epidemiological studies have established that serious health effects are associated with increases in ambient particulate matter in urban air sheds. However, although coherence is strong, this has not been translated to a biological mechanism. Relatively few studies have found the biologically active agents in PM 2.5. Right now we are capable of measuring the mass but not the biologically active fraction. PM 2.5 is a mixture which increases the uncertainty. If we control NOx and hydrocarbons, we are controlling some of the precursors for the formation of particles. There are some things that we are already doing that will enable us to reduce particulate matter. One of these is the controls on SOx for acid rain. Another is the fact that DEP will be looking at truck and bus emissions and this will reduce the fine particle emissions in New Jersey.

Testing for PM 2.5 is complex. In measuring the PM 2.5 sample the mass will be considered related to the epidemiology. However, unlike other pollutants, because it is a complex mixture, you will not get the truth about what is in the mass. The sampler may not allow us to develop control strategies.

More research needs to be done on the relationship between indoor and outdoor PM. The outdoor PM affects indoor levels because buildings are not hermetically sealed. Indoor levels are affected by cooking, fireplace burning and tobacco smoking. There is an absolute quantity that is a person's lung burden coming from both indoor and outdoor sources. This can be three or four times higher than the outdoor source alone.

Fine particles move in the air because it takes one to three days for them to settle. They have very low deposition velocities. If you emit something high enough, it takes days for the particles to settle. Fine particles can get caught up on the air screen and move far away. Studies have shown that it could be that 50% to 70% of the total mass burden of fine particulates in New Jersey is coming from transport. The rate will be higher or lower depending on the weather conditions.

Monitoring poses a problem. We don't have an adequate monitoring network across the country. Monitoring will be complex because we need to have a two stage sample. We need one sample that collects non-volatile components and one that collects a semi-volatile component. Setting the standard for PM 2.5 will be difficult. I would recommend setting it at 20 to 30 micrograms per cubic meter for an annual average. I also recommend targeted research.

### **JOHN ELSTON - Air Quality Management, Administrator, DEP**

There is a problem with the PM 2.5 standard in that there is no "smoking gun" with regard to setting a standard. However, there is circumstantial evidence. We do know that there is no threshold for particulate matter and therefore, wherever we draw the standard there will be a risk for someone. Some say that we shouldn't have a standard, just some sort of risk analysis.

There are three issues to consider when we think about adopting a PM 2.5 standard.

1. When a standard is established, a SIP must accompany it. Without a SIP there is no federally enforceable document. In order to have an effective control program you need to have EPA law behind that program.
2. Regional transport must be considered. The regional transport of ozone and acid rain have already been established and there are some controls in place. In considering particulate matter, the long range transport is critical. The combustion products tend to be light particles which are transported hundreds, maybe thousands of kilometers. Therefore, the regional concept of transport must be considered.
3. Public health standards must be addressed. Over the years there has been a weakening of the standards. The ozone standard has been weakened from .08 to .12. If we do not adopt the PM 2.5 standard and just keep the PM 10 standard, that will be weakened again because the form of the standard is being changed to allow more exceedences to occur under the same standard. This weakening of health standards is not good policy.

Another aspect that needs to be considered is the debate between epidemiology and toxicology. Toxicology has more definitive causality, but epidemiological evidence is no less compelling here and is very important. In epidemiology there is a weight of evidence of many difference studies, but the monitoring is not precisely PM 2.5.

There will be Areas of Violation (AOVs) and Areas of Influence (AOIs). Air quality planning is going through a very radical change, less involved in delineating where the pollution is as in where it originates. An AOI may be anywhere from Virginia to Maine, but an AOV could be Hudson County, New Jersey. We're becoming more involved in contributing sources relative to violations. We're trying to become more stakeholder oriented. We're trying to involve everyone in the process, including neighboring states.

### **CHARLES PIETARINEN - Air Quality Monitoring, Chief, DEP**

There will be four standards for particulate matter, two for PM 10 and two for PM 2.5. We anticipate that New Jersey will continue to be in attainment for PM 10. There will be spatial averaging, but we don't know exactly how that will work. The entire state could be in non-attainment or just certain areas. There will be some averaging of sites and some overall sense of the attainment areas. Although health studies use this averaging effect, we have not used it before now.

In calculating the PM 2.5 standard, we took the data from the PM 10 network and applied a factor of .6 to it to estimate PM 2.5. This was based on national data published by EPA and supported by some limited data that we collected in New Jersey.

A significant amount of research has not been done on the composition of particulate matter in New Jersey. This is because we have been in attainment for PM 10, so we have not done speciation of particles to define the problem.

One area we did test between 1992 and 1995 was Brigantine. This testing shows that the largest particulate component was sulfate, making up 52% of the particles; organics, 27% of the particles; nitrates are 11%, elemental carbon is 6% and soil is a small component. The sulfate, nitrate and organics are all secondary aerosols. They are not emitted directly, but take this form in the atmosphere. They take time to form and are subject to transport so they may not be locally generated. Brigantine was a very limited data site.

There have already been significant improvements in the amount of sulfate particles because of the acid rain program. Acid rain controls focus on sulfur emissions. Because of this, we don't see the same improvements for nitrate values.

We have over 20 years of data on smoke shade in New Jersey. Smoke shade is a surrogate for particulate matter. The levels of smoke shade dropped dramatically throughout the 1970s and have continued to decline.

In determining PM 2.5 values, spatial averaging will come into play. For instance, all of the sites in northern New Jersey and all of the sites in southern New Jersey could be averaged to get 18 micrograms per cubic meter, which would mean non-attainment. There could also be spatial averaging over smaller areas with several sections of the state in attainment and others in non-attainment. Spatial averaging has been controversial within the monitoring community, but it is based on the fact that health studies use this averaging effect. Even with spatial averaging, we estimate that there will be non-attainment over a significant portion of the State.

**ALBERT MANNATO - American Petroleum Institute, Washington, D.C.**

We believe the EPA should not establish a PM 2.5 standard because the scientific basis for PM 2.5 as a causative agent for adverse health effects has not been established. In its closing letter the CASAC said, "There are many unanswered questions and uncertainties associated with the establishment of causality of the association between PM 2.5 and mortality."

It is important to note that association does not equal causation. EPA is relying totally on epidemiological studies and the greatest relative risk within these studies is 1.3. Most of the studies show a relative role of 1.1 or less. The scientific community generally considers risks that small as unreliable evidence of a causal link. In other areas EPA has rejected such a low risk.

The court-ordered deadline also hindered the standard development process. CASAC's letter supports this. EPA has failed to address the concerns raised by CASAC. EPA only looked at the vote and ignored the substance of CASAC's concerns.

There is no justification of PM 2.5 as a causative agent because almost all of the epidemiological studies did not use PM 2.5. The criteria document lists 38 studies and 1/3 of those studies were negative. Further, only two of those studies looked at PM 2.5. There were actually nine PM 2.5 studies and five of them were negative. Even Harvard's Sick Cities Study is questionable. The Pope study that was used to estimate death benefits from PM 2.5 had incorrect results. The study should have shown 15,000 deaths not 20,000. In cities where there have been multiple investigations, there were inconsistent results. The data just isn't consistent.

I believe that the CASAC voted in favor of the PM 2.5 standard because without a standard, you cannot collect the monitoring data that you need. Great progress has been made in New Jersey regarding NOx and SOx and ozone, but if the new standard is enacted, based on our estimates, we think that all of the counties in New Jersey will not be able to meet the new particulate standard.

We believe the EPA grossly underestimated the cost of this standard and overestimated the benefits. EPA put artificial cost construction on the analysis of the PM 2.5 standard. Our contractor, Sierra, estimated that in Chicago it would take a 90% reduction in emissions to meet the standard and in New York, a 70% reduction. New Jersey will also be worse off with these standards. We join others who oppose the new standards because there is no scientific basis for them. We recommend keeping PM 10 the way it is because the cost of change is prohibitive.

**BARBARA TURPIN - Environmental Sciences, Rutgers University, Assistant Professor**

I have been involved in the development of the EPA criteria document, which is the scientific basis for the

proposed standard. I have also been discussing with EPA the research needed for PM 2.5. I have a background in atmospheric particulate matter, chemistry and physics.

Economics should not play a role in setting air quality standards. The health based standards are important. Over 50 studies show that the current PM 10 standard is not adequate.

Fine and coarse particles differ from one another because they are generated by different mechanisms. Fine particles are formed in combustion processes directly emitted as particles or they are formed in the atmosphere from photochemical reactions with gas phase precursors, such as SO<sub>x</sub> and NO<sub>x</sub>. Like ozone, these fine particles are transported long distances. They are able to penetrate into the air exchange regions of the lungs.

In contrast, coarse particles are formed by mechanical processes, have a shorter life span and are largely composed of soil and dust. They are removed largely in the upper airways.

The epidemiological studies are largely based on PM 10 because a data base for PM 2.5 doesn't exist. We think the epidemiological studies relate to the fine particle portion of PM 10. Most of PM 10 is coarse particles dominated by soil and dust. Fine particle PM 2.5 contains much more toxic materials. There are good scientific reasons to treat fine and coarse particles separately.

There are uncertainties regarding the plausible mechanism by which PM 2.5 causes these effects. There is also considerable disagreement on the level of the standard. However, there is substantial agreement on the role of a fine particulate standard. A good argument centers on the fact that to reduce fine particles, which are carried into the lower respiratory regions, you need a PM 2.5 standard.

I would like to argue for an interim standard. If the current EPA proposal were implemented control efforts wouldn't begin until 2004. Before implementation we would need to establish a monitoring network and we would need three years of data. We would also need to develop new SIPs. It would be ten years or so before compliance would be necessary.

There is no reason why we can't be doing these things concurrently with further mechanistic research. There are some problems with doing chemical analysis on the current PM 2.5 sampler because of the collection method used. This chemical analysis is essential in order to do source apportionment and to develop effective SIPs. It is important that the federal sampler is suitable for chemical analysis and for air quality needs. The control of these gas phase precursors will be essential in devising effective air quality management plans.

**BERNARD GOLDSTEIN - EOSHI, Director**

In addition to my current post, I am a former chairman of the CASAC. I think the PM 2.5 is a better standard. Ozone and particulate matter are difficult pollutants to source out because they are formed by a very complex photochemical process that we have to understand. The PM problem is that we have a mixture. The biggest deficiency is that the research doesn't completely understand the causes that are responsible for the effects.

We need better ways to study and research the effects of air pollution on humans. We have always looked at healthy humans and healthy animals. We need to look at sick animals and sick humans. Some of these particles are not toxic to healthy humans. We don't know exactly what particles, sulfates or organics are causing the health problems.

If we had this epidemiological data in the mid 1980s, we would have had a stronger particulate standard rather than an acid rain program. We noticed the effects of acid rain on the trees, lakes and fish before we noticed the effects of particulates formed from SO<sub>x</sub> and NO<sub>x</sub> on humans. Now we need to evaluate what effect PM 2.5 has on human health.

**TIM DILLINGHAM - Sierra Club, Director**

I am not a toxicologist or an epidemiologist, nor a representative of industry. I can only give you a sense of what the Sierra Club membership believes we should do with regard to PM 2.5. We can get lost in debate about the science of this standard. We may never reach the point scientifically when we have a bright line to follow regarding fine particulates. My members are concerned with the impact of PM 2.5 on people's lives.

Hospital admissions, rates of asthma and respiratory disorders are on the rise in New Jersey. This should be our main concern, not the scientific debate. If we keep debating the standard, we will never move toward implementation. Industry has always overestimated the cost of environmental regulations, specifically air strategies. After we set the standards, then we can enter into a discussion of the cost in a way that does not create undue burdens.

**MARIE CURTIS - New Jersey Environmental Lobby, Executive Director**

The New Jersey Environmental Lobby for almost 30 years has represented local and statewide environmental groups here in Trenton as a lobbying arm for the environment. We endorse the new EPA proposal for PM standards.

The epidemiological studies that we heard about today were done by reputable organizations, such as the Harvard School of Public Health, American Cancer Society, American Lung Association and the Natural Resources Defense Council. We have also seen studies from Canada, Alaska and elsewhere. The evidence is overwhelming that small particles penetrate deeply into the lungs causing cellular damage.

In 1993 the New England Journal of Medicine studied 8,000 people in six cities over 17 years and found a 26% greater risk of early death in areas of high fine particulate concentrations. A 1995 study involving 155,000 people in 51 metropolitan areas found a risk of premature death to be 17% higher than normal. Rather than debate the numbers, I submit that one early death from something we can control in the environment is one death too many. We cannot put a price tag on life.

It is true that 19 out of 21 members of the CASAC want to set a standard. The disagreement is on what the standard should be. The fact that the EPA time line puts compliance off for several years gives us time to do the needed research. An interim standard could also be considered.

Because fine particulates are formed secondary to the transformation of acid gases by atmospheric processes, transport is important. Also, because New Jersey is a corridor state, emissions from diesel exhaust is a primary concern. We also still have four coal burning power plants in New Jersey. Industry is complaining about the cost, however, in sulfur dioxide reduction we were told that it would be two to three thousand dollars per ton for emissions avoided. Currently on the Stock Exchange, the price is \$65.00 per ton. These costs are always exaggerated.

The standard should be PM 2.5 in light of increasing childhood asthma and increasing cardiopulmonary disease.

**BETTY WOLFE - Joint Bureau Township Princeton Environmental Commission, Chairman**

We are citizens not experts in health or air pollution. However, we are very concerned about the rise in asthma and respiratory problems in New Jersey. We question if the current Clean Air Standards are adequate to protect the public health.

The pollution alert days that we only heard about in California are now here in New Jersey. Tighter standards, more accurate monitoring, diligent implementation is needed.

We want the federal government to support New Jersey's efforts to protect public health by setting a more stringent particulate standard. I regret that the Clean Air Council was not able to have this hearing within the time frame of the formal public comment period for EPA so that New Jersey could be on the EPA record.

**REBECCA STANFIELD - New Jersey Public Interest Research Group (NJPIRG) Citizen Lobby**

I would like to add the voice of NJPIRG citizen lobby and its 25,000 New Jersey members to the voices of the Sierra Club and the Environmental Lobby in supporting the new standard for PM 2.5. Our concern is protecting the public health. Many epidemiological studies have shown the correlation between PM 2.5 and mortality and illness. 19 out of 21 members of CASCA agree that a new standard is necessary. EPA is required to act.

Cost is the only relevant to the implementation stage. Monitoring stations for PM 2.5 are critical. They need to be developed and put in place. Finally the non-attainment areas should not dissuade us from adopting the new standard. All of these problems will be addressed after we set a new standard.

Anecdotally, as NJPIRG canvases from door to door, we hear stories of more kids with inhalers in school and children unable to go outside. NJPIRG strongly supports the proposed standard for PM 2.5.

**JAMES SINCLAIR - New Jersey Business and Industry Trade Association**

In addition to the NJ Business and Industry Trade Association, I also represent the South Jersey Chamber of Commerce and the NJ Air Standards Coalition, which includes over 21 associations and federations representing most of the major employers in the State.

I am an engineer and a student of public policy. I understand that scientific thinking and rational thinking are not always the same as political thinking. I've made an effort to assess the facts regarding the new standard for particulate matter.

The shocking aspect to these discussions is that only one or two of the studies dealt with PM 2.5 and the results of those studies were inconclusive. From a scientific point of view that doesn't make sense. We don't know how to analyze PM 2.5 and we don't know where it comes from or if it has an impact.

We don't inform people of New Jersey about the improvement in air quality, we just say that we have the second worst air in the nation. We also can't tell people that the proposed standard will solve the asthma problem when we don't know that. The underlying cause of asthma is unknown. It is highly unlikely that outdoor air pollution is causing the increase because air pollution levels have been decreasing.

Governor Whitman supports the new standard because she thinks it levels the playing field. But, there will be non-attainment in all of New Jersey's counties if we adopt the new standard. My organization thinks that we should keep the current standard and do more research on the effects of PM 2.5.

**REVEREND JOSEPH PARRISH, Rector - St. John Episcopal Church, Elizabeth, NJ**

We urge NJDEP to tighten air quality standards. In and around Elizabeth we have an 800% greater incidence of childhood asthma that the national average and 1,000 to 5,000 % greater incidence of childhood asthma deaths than the national average. Although ozone is decreasing, smoke shade in Elizabeth is increasing and is the highest in the State. Our air quality is unacceptable for human health. Since 1990 we have not had a significant increase in industrial facilities or power plants, but we have four incinerators. Some of these plants do not have adequate controls. There are current plans to site another incinerator in our area and a new medical waste treatment plant in Linden. With the New Jersey Turnpike and Newark Airport we have excessive mobile sources as well.

We believe a PM 2.5 standard would be helpful because the greatest threat is from these small biologically active particulates which become entrapped in our lungs. We urge the immediate closing of all four incinerators. We urge blocking the expansion of the New Jersey Turnpike and Newark Airport. We urge a total moratorium on incinerators anywhere in the State.

I have a degree in medical science from Harvard and in my estimation the PM 2.5 seems the most lethal of the particulates. Inert particles, such as sand or glass are not as problematic as biologically active particulates. The variability in PM 2.5 may come from the fact that fine particles could be composed of such things as dioxin or radioactive particles. Research into the nature of fine particulates is essential to the public health.

**WRITTEN TESTIMONY**

**EDWARD HOZZOURI - Sun Oil Company**

Sun Oil Company opposes the revision of the particulate matter standard at this time and recommends that EPA initiate a comprehensive data collection and analysis effort to re-examine the standard in five years.

Sun supplies over 750 million gallons of gasoline to New Jersey through all channels of distribution. New Jersey is a core state in Sun's business planning. Sun's stake in revision to the NAAQS for particulate matter derives from stationary and mobile sources. The more stringent standards will require significant emission reductions from manufacturing sources and from autos and trucks.

Sun has voluntarily participated in programs aimed at reducing air pollution and increasing energy conservation. Sun has demonstrated continuous improvement in environmental performance. The reasons we oppose any change in NAAQS are as follows:

1. The Clean Air Act does not mandate revision but requires review of the standard every five years.
2. Air quality is improving and the reduction in PM 10 concentrations has been substantial. From 1988 to 1995 PM declined 22%. These improvements occurred while vehicle miles traveled increased, population grew and the economy was fairly robust.
3. Reservation about the health benefits accruing from the revision have been expressed by the CASAC. There is no established causal connection between particulate matter and health effects.
4. With no statutory requirement and incomplete data, EPA should not impose a massive new environmental regulations at this time.

The cost is between six to 18 billion dollars per year. Technology is not available to enable sources to comply. Jobs will be lost as well. In the Philadelphia region over 1400 jobs will be lost. On the national scale 1.3 million jobs will be lost. The health disbenefits of job loss are well documented. Additional controls, such as enhanced I/M and NOx controls should be allowed time to be effective and more research on PM 2.5 should be conducted.

#### **DEBRA DILORENZO - Chamber of Commerce Southern New Jersey, President**

The Chamber of Commerce of Southern New Jersey is the largest state regional chamber with over 1,400 member companies employing over 250,000 people. Many of the chamber's member companies would be adversely impacted if EPA proposed standard is adopted.

The Chamber supports the goals of the Clean Air Act to protect the public health and recognizes the gains that have been made in clean air quality, a 36% improvement over the past decade.

A more stringent PM 2.5 standard would significantly increase the number of non-attainment areas in New Jersey. Studies show that over one half of New Jersey counties would be out of compliance. The standard would significantly increase cost to businesses.

The cost of compliance far outweighs the health benefits. A study conducted by New York University indicated that hospital admissions will decrease only minimally under the new standard.

There are so many questions and uncertainties associated with the PM 2.5 standard that the Chamber believes EPA should implement a research program into PM 2.5 and leave the PM 10 standard in place.

#### **NJ DEPARTMENT OF HEALTH AND SENIOR SERVICES**

The NJ Department of Health and Senior Services (NJDHSS) supports the EPA's proposal to maintain current PM 10 standards and to propose additional annual and daily standards for PM 2.5. The new standards are needed to protect the public health.

Particulate matter is associated with premature death, hospital admissions and Emergency Room visits, asthma and bronchitis. The current PM 10 standard alone is insufficient.

The fine particulate fraction formed through the process of fossil fuel combustion contains the most toxic portion of the particles (organics, ammonium, sulfates and nitrates) providing a

biologically plausible mechanism for causality.

Subpopulations are at higher risk from fine particulates. These include senior citizens, who die prematurely or are admitted to hospitals; children, whose respiratory systems are more susceptible to environmental

threats; asthmatics, whose asthma is aggravated by fine particles and lastly, persons with respiratory and cardiovascular disease.

The NJDHSS believes that the current PM standard is inadequate and supports EPA's proposal to add daily and annual standard for PM.

**CHEMICAL INDUSTRY COUNCIL OF NEW JERSEY (CIC/NJ)**

The CIC/NJ is a trade association representing 105 members of the chemical process industry and 50 environmental consultants and legal firms. We represent a significant portion of the regulated community who will be impacted by the PM standard revisions.

We believe that the proposed changes in PM 10 would force much of New Jersey into non-compliance. Currently, on a hot summer day with winds blowing south and north, New Jersey fails to meet existing standards. To adopt even more stringent standards will only result in penalizing New Jersey industry without benefits of air quality improvement. CIC/NJ believes that while downwind pollutants from other states are a major problem facing New Jersey, the current air standards are more than adequate.

Further, new standards will destroy existing and future employment opportunities in New Jersey. It will require draconian control measure that will weigh heavily on our fragile manufacturing sector. The public health risks associated with unemployment and poverty outweigh the inadequately justified health benefits of this new standard. It appears that special interest politics play a far greater role than science, public health or cost.

**ELIZA BETH GRIFFITHS MT/ASCP and DR. JONATHAN S. GRIFFITHS, Ph.D.**

As a medical professional and a chemist we find the scientific data supporting the increased PM standard unequivocal. We know that tiny particles in the air can lodge in the lung and cause life-threatening difficulties for millions of Americans. Particles smaller than 2.5 micrograms behave like gases, getting deep into the lungs and causing serious damage. Both the law and the findings of science require that EPA move forward with new and better standards for our nation's air quality.

We urge the EPA to set a standard of 18 micrograms of particulates per cubic meter of air over a 24 hour period. The 50 micrograms currently being proposed seems to us below what should be standard.

It is time to decide that people are more important than the financial gain of specific industries. Collective health is not worth the risk of lowering air quality standards. We have asthmatic children and are aware of the danger of poor air quality. New and higher air quality standards need to be implemented.

**VINCENT LEHOTSKY**

I wish to question the relationship between the new standard for particulates and dust from dredged spoils in our harbors. These materials dry and break down with the outer layers obtaining a dusty-like texture. Why is there no testing of the contents of the dredged spoils?

I have noticed that the dredge spoils coming from the "Orion Project" in Elizabeth produces a lot of dust and I am concerned that this dredged material needs to be tested.

**MARC LAVIETES, M.D. - NJ Physicians for Social Responsibility, President**

Clean air should not be an issue for political debate or political compromise. It should be a matter of public health. New information concerning pollutants makes it important to review the clean air standards every five years. The review of the PM standard resulted in New a new standard being proposed. A Harvard study linked levels of PM in over 150 cities with increased mortality rates. Living or coming to work in many of our major cities constitutes a threat to heart and lung health.

The public should be aware of the proposed standards and the fact that averaging will be misleading in terms of the air quality in a given area. It is time to set air quality standards which protect the health of our children, the sick and the elderly.

**The following concerned parties sent the same letter in written testimony:**

**KENNETH R. WINTER - Winter Yacht Basin, President and General Manager**  
**ALAN DAVIDSON - Marine Trades Association of New Jersey, Legislative Chairman**  
**ROBERT G. LANGE, JR., - Holiday Harbor Marina, Owner**  
**CHRIS SABATINI - Somers Point Marina, President**  
**JILLIAM KOCI - Cape May Marina**  
**MICHAEL MOCK - Sportsman's Marina**  
**KENNETH R. WINTER - Winter Yacht Basin, President**  
**ALAN DAVIDSON - Marine Trades Association of NJ, Legislative Chairman**  
We are opposed to the EPA's proposal to revise the National Ambient Air Quality Standard for particulate matter from PM 10 to PM 2.5. This new standard will adversely impact both the manufacturer of boats and the end-user. There may even be episodic bans on recreational boating as a mean of meeting the requirement of the SIP.

Existing boat plants are already severely regulated and more stringent standards will create undue pressures for facilities so that boat builders could face a freeze on new construction and new jobs. For the boating industry the new standard threatens our jobs and survival. We suggest that a careful cost benefit analysis be done to resolve this matter.

**ADELAIDE FRANKLIN - Main One Marina, Inc., President**  
Years ago there was a study done on the travel patterns of New Jersey employees to determine how a reduction in auto emissions might be achieved. I question what became of that study. The marine industry has been hit hard with regulatory restrictions. We complied with the many requirements but it is inconceivable that we now might be faced with the prospect of boating being restricted on weekends. Marinas and other related businesses will have to go out of business. Marine engines are now being built to specifications which will greatly reduce toxic emissions. This should be enough.

**Editor: Eileen Hogan, M.A.**

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