

October 21, 2010

TO: Members of the MAG Air Quality Technical Advisory Committee

FROM: Doug Kukino, Glendale, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Thursday, October 28, 2010 - 1:30 p.m.  
MAG Office, Suite 200 - Saguaro Room  
302 North 1<sup>st</sup> Avenue, Phoenix

A meeting of the MAG Air Quality Technical Advisory Committee has been scheduled for the time and place noted above. Members of the Air Quality Technical Advisory Committee may attend the meeting either in person, by videoconference or by telephone conference call. Those attending by videoconference must notify the MAG site three business days prior to the meeting. If you have any questions regarding the meeting, please contact Chair Kukino or Lindy Bauer at 602-254-6300.

Please park in the garage underneath the building, bring your ticket, and parking will be validated. For those using transit, Valley Metro/Regional Public Transportation Authority will provide transit tickets for your trip. For those using bicycles, please lock your bicycle in the bike rack in the garage.

In 1996, the Regional Council approved a simple majority quorum for all MAG advisory committees. If the MAG Air Quality Technical Advisory Committee does not meet the quorum requirement, members who arrived at the meeting will be instructed a legal meeting cannot occur and subsequently be dismissed. Your attendance at the meeting is strongly encouraged. If you are unable to attend the meeting, please make arrangements for a proxy from your entity to represent you.

Pursuant to Title II of the Americans with Disabilities Act (ADA), MAG does not discriminate on the basis of disability in admissions to or participation in its public meetings. Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting Jason Stephens at the MAG office. Requests should be made as early as possible to allow time to arrange the accommodation.

## TENTATIVE AGENDA

### COMMITTEE ACTION REQUESTED

1. Call to Order

2. Call to the Audience

An opportunity will be provided to members of the public to address the Air Quality Technical Advisory Committee on items not scheduled on the agenda that fall under the jurisdiction of MAG, or on items on the agenda for discussion but not for action. Members of the public will be requested not to exceed a three minute time period for their comments. A total of 15 minutes will be provided for the Call to the Audience agenda item, unless the Air Quality Technical Advisory Committee requests an exception to this limit. Please note that those wishing to comment on action agenda items will be given an opportunity at the time the item is heard.

3. Approval of the September 23, 2010 Meeting Minutes

4. Update on the EPA Proposed Partial Approval and Disapproval of the MAG 2007 Five Percent Plan for PM-10

On September 3, 2010, the Environmental Protection Agency (EPA) signed a notice to propose partial approval and disapproval of the MAG 2007 Five Percent Plan for PM-10 based on the timetable in the consent decree with the Arizona Center for Law in the Public Interest. The notice was published in the Federal Register on September 9, 2010, and comments were due by October 12, 2010. If EPA finalizes the partial disapproval on January 28, 2011, a conformity freeze on the MAG Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP) would occur in approximately thirty days; only projects in the first four years could proceed.

2. For information.

3. Review and approve the September 23, 2010 meeting minutes.

4. For information and discussion.

If the problem is not corrected within eighteen months, tighter controls on major industries would be imposed. If the problem is still not corrected within twenty-four months of the disapproval, the loss of federal highway funds (\$1.7 billion) and a federal implementation plan would be imposed. Conformity would also lapse, which would place the \$7.4 billion TIP at risk.

On October 1, 2010, a videoconference was conducted with EPA to discuss issues with the EPA Exceptional Events Rule and recommendations from the Arizona Department of Environmental Quality (ADEQ) and MAG. On October 4, 2010, MAG and ADEQ sent a letter to EPA requesting a sixty day extension of the comment period for the proposed action on the Five Percent Plan. On October 7, 2010, EPA sent a letter to MAG and ADEQ granting an extension of the public comment period to October 20, 2010. On October 8, 2010, an Air Quality discussion with EPA and ADEQ was held to discuss the review of the ADEQ Exceptional Events Documentation and potential solutions to avoid a conformity freeze. At the October 11, 2010 Executive Committee telephone conference call meeting, the Committee discussed that a letter from MAG, as well as a joint letter from MAG, ADEQ, and Maricopa County would be submitted during the public comment period.

On October 20, 2010, MAG, ADEQ, Maricopa County, and Gila River Indian Community submitted comments into the public record. Other comments were also submitted. In addition, EPA has responded to some of the questions from MAG, ADEQ, and Maricopa County regarding a Revised Five Percent Plan for PM-10. Please refer to the enclosed material.

5. Status of Ongoing EPA Review of National Ambient Air Quality Standards for Particulate Matter

In accordance with the Clean Air Act, the Environmental Protection Agency is in the process of reviewing the National Ambient Air Quality Standards for particulate matter. Preliminary rulemaking is scheduled for February 2011, with final rulemaking in October 2011. A presentation on the options being considered and the implications for the MAG region will be given. Please refer to the enclosed material.

6. Call for Future Agenda Items

The next meeting of the Committee has been tentatively scheduled for **Tuesday, November 30, 2010** at 1:30 p.m. The Chairman will invite the Committee members to suggest future agenda items.

5. For information and discussion.

6. For information and discussion.

MINUTES OF THE  
MARICOPA ASSOCIATION OF GOVERNMENTS  
AIR QUALITY TECHNICAL ADVISORY COMMITTEE MEETING

Thursday, September 23, 2010  
MAG Office  
Phoenix, Arizona

MEMBERS ATTENDING

Doug Kukino, Glendale, Chairman  
Larry Person, Scottsdale, Vice Chair  
Sue McDermott, Avondale  
#Elizabeth Biggins-Ramer, Buckeye  
#Jim Weiss, Chandler  
#Jamie McCullough, El Mirage  
Kurt Sharp, Gilbert  
\*Cato Esquivel, Goodyear  
Scott Bouchie, Mesa  
#Janet Ramsey for William Mattingly, City of Peoria  
Phil McNeely, Phoenix  
#Antonio DeLaCruz, Surprise  
Oddvar Tveit, Tempe  
#Mark Hannah, Youngtown  
Ramona Simpson, Queen Creek  
\*American Lung Association of Arizona  
Wendy Crites for Grant Smedley, Salt River Project  
\*Brian O'Donnell, Southwest Gas Corporation  
Mark Hajduk, Arizona Public Service Company  
\*Gina Grey, Western States Petroleum Association  
\*Valley Metro/RPTA  
Dave Berry, Arizona Motor Transport Association  
Jeannette Fish, Maricopa County Farm Bureau

Steve Trussell for Russell Bowers, Arizona Rock  
Products Association  
\*Greater Phoenix Chamber of Commerce  
Amanda McGennis, Associated General  
Contractors  
Spencer Kamps, Homebuilders Association of  
Central Arizona  
\*Mannie Carpenter, Valley Forward  
\*Erin Taylor, University of Arizona Cooperative  
Extension  
Keith Killough for Beverly Chenausky, Arizona  
Department of Transportation  
Diane Arnst, Arizona Department of  
Environmental Quality  
\*Environmental Protection Agency  
Jo Crumbaker, Maricopa County Air Quality  
Department  
#Duane Yantorno, Arizona Department of  
Weights and Measures  
\*Ed Stillings, Federal Highway Administration  
\*Judi Nelson, Arizona State University  
\*Christopher Horan, Salt River Pima-Maricopa  
Indian Community

\*Members neither present nor represented by proxy.  
#Participated via telephone conference call.  
+Participated via video conference call.

OTHERS PRESENT

Lindy Bauer, Maricopa Association of Governments  
Dean Giles, Maricopa Association of Governments  
Patrisia Magallon, Maricopa Association of  
Governments  
Julie Hoffman, Maricopa Association of Governments  
Feng Liu, Maricopa Association of Governments  
Taejoo Shin, Maricopa Association of Governments  
Randy Sedlacek, Maricopa Association of Governments  
Matt Poppen, Maricopa Association of Governments  
Ranjith Dandanayakula, Maricopa Association of  
Governments  
Mitch Wagner, Maricopa County Department of  
Transportation  
Amy Bratt, Greater Phoenix Chamber of Commerce

Frank Schinzel, Maricopa County Air Quality  
Joe Gibbs, City of Phoenix  
Michelle Wilson, City of Glendale  
Russell Van Leuven, Arizona Department of  
Agriculture  
Mary Ellen Boom, Happy Planet Consulting  
Shane Kiesow, City of Apache Junction  
Heather Hodgman, City of Apache Junction  
Scott DiBiase, Pinal County  
Beth Lewallen, Maricopa County  
Will Barnow, Maricopa County  
Scott Hughes, Cal Portland  
Rusty Bowers, Arizona Rock Products Association

1. Call to Order

A meeting of the MAG Air Quality Technical Advisory Committee was conducted on September 23, 2010. Doug Kukino, City of Glendale, Chair, called the meeting to order at approximately 1:32 p.m. Antonio De La Cruz, City of Surprise; Mark Hannah, Town of Youngtown; Jamie McCullough, City of El Mirage; Elizabeth Biggins-Ramer, Town of Buckeye; Jim Weiss, City of Chandler; Janet Ramsey, City of Peoria; and Duane Yantorno, Arizona Department of Weights and Measures, attended the meeting via telephone conference call.

2. Call to the Audience

Mr. Kukino stated that according to the MAG public comment process, members of the audience who wish to speak are requested to fill out comment cards, which are available on the tables adjacent to the doorways inside the meeting room. Citizens are asked not to exceed a three minute time period for their comments. Public comment is provided at the beginning of the meeting for nonagenda items and nonaction agenda items. He noted that no public comment cards had been received.

3. Approval of the July 29, 2010 Meeting Minutes

The Committee reviewed the minutes from the July 29, 2010 meeting. Amanda McGennis, Associated General Contractors, moved and Jeannette Fish, Maricopa County Farm Bureau, seconded and the motion to approve the July 29, 2010 meeting minutes carried unanimously.

4. Update on CMAQ Projects for the Federal Fiscal Year 2010 Interim Year End Closeout

Dean Giles, MAG, provided an update on the Congestion Mitigation and Air Quality Improvement (CMAQ) projects for the Federal Fiscal Year 2010 Interim Year End Closeout. Mr. Giles stated that on May 25, 2010, the Air Quality Technical Advisory Committee made a recommendation to forward the CMAQ evaluation to the Transportation Review Committee (TRC) for use in prioritizing projects for fiscal year 2010 CMAQ funding. He added that on May 28, 2010, the TRC made a recommendation and the MAG Management concurred to program \$2.2 million that was available to three existing projects in the Transportation Improvement Program (TIP). Mr. Giles noted that projects vying for the fiscal year 2010 interim year end closeout funds should be in an advanced stage of the project development process and close to obligation through the federal process. He mentioned that the process is conducted in May which means that there are approximately three months for project obligation by the Arizona Department of Transportation. In June 2010, the MAG Regional Council approved the interim closeout. Mr. Giles added that the three projects receiving funding include a City of Glendale multi-use path project at Skunk Creek and Union Hills Drive and two City of Mesa ITS projects.

5. Update on Exceptional Events and MAG Five Percent Plan for PM-10

Ms. Bauer provided an update on the exceptional events and MAG Five Percent Plan for PM-10. She stated that since the Committee last met, MAG, along with the Arizona Department of Environmental Quality (ADEQ), Maricopa County, and the Salt River Pima-Maricopa Indian Community, submitted letters to the Environmental Protection Agency (EPA) requesting a six month delay on the proposed action for the Five Percent Plan for PM-10 as well as final action on the Plan. She added that a six month delay was requested to enable EPA to review all of the scientific information prepared in its

totality on the four high wind exceptional events which concerned EPA. In addition, the Arizona Congressional Delegation also submitted a letter requesting a delay and discussing the need for fairness in the process. Ms. Bauer indicated that the Delegation also conducted a telephone conference call with EPA to request a six month delay. The Environmental Protection Agency responded by indicating that this was a consent decree and would have to move forward. Ms. Bauer noted that EPA sent letters on September 2, 2010 to the Delegation, MAG, and ADEQ indicating that there were issues with the inventories.

Ms. Bauer stated that on September 3, 2010, EPA signed a notice to partially disapprove and approve the Five Percent Plan for PM-10. She noted that a partial approval and disapproval under the Clean Air Act has the same consequences as a disapproval. Ms. Bauer added that the approvability issues in the notice are technical in nature and did not cause the high wind exceptional events at the West 43<sup>rd</sup> Avenue monitor. She commented that the Plan has been effective and there have been no violations during stagnant conditions at the monitors since the Plan was submitted in 2007. Ms. Bauer mentioned that ADEQ and MAG believe that the region had its first year of clean data in 2008. EPA disagrees with MAG and ADEQ. She stated that it is important to point out that EPA has not reviewed all of the scientific information that was submitted. Ms. Bauer noted that in August 2010 a great deal of additional scientific information was provided from ADEQ with assistance by MAG. She commented that ADEQ also reformatted the information to please EPA. Again, EPA has not yet reviewed all of the scientific information.

Ms. Bauer stated that \$1.7 billion in federal highway funds and the \$7.4 billion Transportation Improvement Program are at risk. She added that a conformity freeze on the TIP could occur by February 28, 2011. Ms. Bauer commented that EPA has acknowledged that their Exceptional Events Rule is flawed; however, they are forced to use the rule. Ms. Bauer indicated that until the Exceptional Events Rule is fixed, the problem will remain unresolved. She noted that this region will always have high winds that can not be controlled.

Ms. Bauer stated that some citizens in various communities are worried about the air quality in their area. She presented a map to put the issue in perspective. The map provides the 11 exceedances in 2008 listed by monitor. Ms. Bauer noted that all of the exceedances with the exception of one were due to high wind exceptional events. She added that 11 exceedances at four monitors on eight days in 2008 means that the air in the region was clean 99.8 percent of the time.

Ms. Bauer discussed the EPA proposed partial approval and disapproval of the Plan. She added that the proposed disapproval included the 2005 baseline emissions inventory which indicates the various sources of emissions. Ms. Bauer mentioned that the inventory is the foundation of the Five Percent Plan for PM-10. The Environmental Protection Agency is contending that the construction emissions were overestimated due to a rule effectiveness issue. Ms. Bauer noted that at the time, the economy was robust and the region had a great deal of road building, commercial, and home building construction. She indicated that the County used a different methodology and EPA had an issue with the rule effectiveness. Ms. Bauer noted that the County used a methodology that was used in the past.

Ms. Bauer stated that MAG prepared the projected inventories which EPA is proposing to disapprove. In addition, MAG prepared the modeling attainment demonstration. Ms. Bauer noted that EPA is indicating that they can not approve a modeling attainment demonstration in the Plan since the region failed to attain at the monitors. She added that this disapproval ties back to the EPA nonconcurrency

with the four high wind exceptional events. Ms. Bauer indicated that EPA is also proposing to disapprove the five percent reductions in emissions which were based on the 2005 inventory.

Ms. Bauer presented a diagram that represents the role of the 2005 PM-10 emissions inventory in the Five Percent Plan process. She noted that the emissions inventory is a very critical piece in the Plan. Ms. Bauer indicated that the emissions inventory impacts the Motor Vehicle Emissions Budget, Five Percent Reduction Demonstration, Reasonable Further Progress and Quantitative Milestones, and the Contingency Measures. She added that credit was taken for the measures in the attainment demonstration. Ms. Bauer presented the 2005 emissions inventory pie chart. She noted that Maricopa County has also prepared a 2008 PM-10 Emissions Inventory, which has been presented to the Committee. Ms. Bauer stated that the construction emissions were much larger in the 2005 emissions inventory; however, the Plan has control measures on all the different sources. She indicated that MAG will be commenting on the notice of the proposed rulemaking.

Ms. Bauer stated the EPA also proposed disapproval of the reasonable further progress, which is the annual emission reductions to ensure attainment. In addition, EPA is proposing disapproval of the milestone demonstrations (every 3 years) since the region did not attain the standard at the monitors in 2008. Ms. Bauer noted that this is also attributed to EPA's nonconcurrence with the exceptional events. She mentioned that EPA also indicated that the contingency measures cannot be approved since they do not have surplus benefits. Ms. Bauer added that the contingency measures are required to have extra benefits above and beyond what is needed for attainment. She commented that EPA has stated that the contingency measures are no longer surplus since the region failed to attain the standard at the monitors in 2008. Ms. Bauer stated that EPA proposed disapproval of the 2010 Motor Vehicle Emissions Budget which is based on the 2010 emissions inventory projected from the 2005 inventory. She added that this budget is used for conformity when approving the MAG Transportation Improvement Program and the Regional Transportation Plan. Ms. Bauer indicated that MAG has to make sure that these pass the federal conformity test since the emissions cannot exceed the Motor Vehicle Emissions Budget.

Ms. Bauer stated that EPA proposed approval of 20 measures in the Plan as well as the Agricultural Best Management Practices Guidance Booklet and Pocket Guide. She added that EPA proposed limited approval and disapproval of some of the agricultural rules. The EPA has indicated that the rules strengthen the SIP; however, EPA is concerned that they do not meet the requirements for enforceable Best Available Control Measures. Ms. Bauer commented that EPA has also indicated that the agricultural general permit rule needs to be revised.

Ms. Bauer thanked the Committee for all the hard work they put into the Five Percent Plan for PM-10. She thanked the private and public sectors for working so hard on the measures that go to all the different pieces of the pie chart. Ms. Bauer noted that this Plan was quite an effort and a painful process and MAG appreciates their hard work. She indicated that MAG disagrees with the Environmental Protection Agency on the exceptional events.

Ms. Bauer stated that MAG is very concerned with the conformity freeze which would only allow projects in the first four years of the conforming TIP and Regional Transportation Plan to proceed. She stated that if additional funds are provided by the federal government, new major projects may need to be added to the TIP and RTP. However, those projects that require a conformity determination would not be able to be included or built due to the conformity freeze. Ms. Bauer mentioned that there could be no new TIPs, RTPs, or projects until a plan revision is submitted that fulfills the Clean Air

Act requirements, EPA finds the budget for conformity adequate or EPA approves the plan, and conformity to the plan revision is determined. Ms. Bauer noted that previously, MAG reported a 30 to 90 day time period for the freeze from the effective date of the notice. She pointed out that when EPA published their proposed action, it indicated that the time period is 30 days from the effective date of the final notice.

Ms. Bauer stated that at a previous Committee meeting, Diane Arnst, ADEQ, pointed out that there was some language in the EPA write up on conformity that the freeze could potentially be lifted earlier. She added that MAG posed that question to EPA. Ms. Bauer indicated that the Clean Air Act sanctions would be triggered based upon when EPA goes final with their decision. She noted that the timetable is still the same with EPA signing the notice on January 28, 2011. Ms. Bauer commented that a partial disapproval from EPA would trigger the sanctions clock. She indicated that if the problem is not corrected within 18 months, tighter controls will be imposed on business and industry. Ms. Bauer added that if the problem is still not corrected within 24 months, it could result in the loss of the federal highway funds and a Federal Implementation Plan could be imposed. She noted that on the day the highway sanctions are imposed, a conformity lapse would occur on the Transportation Improvement Program; therefore, major projects could not proceed.

Ms. Bauer discussed the consequences for the Five Percent Plan for PM-10, based upon the EPA notice. She stated that a new emissions inventory appears to be needed. Ms. Bauer added that Maricopa County has come before this Committee on two occasions to present the new 2008 periodic emissions inventory. She noted that the County has some questions based upon the notice that was published by EPA. Maricopa County will be asking those questions to EPA to make sure that the new 2008 inventory is good to use. EPA has indicated that they would like a Best Available Control Measure (BACM) Analysis completed of all the other PM-10 nonattainment areas in the country to make sure that this Plan has the Best Available Control Measures. Ms. Bauer mentioned that EPA has already approved a BACM Analysis and a Most Stringent Measure Analysis for the region when MAG prepared the Serious Area Plan for PM-10. She commented that MAG will be questioning EPA about the necessity for a BACM Analysis.

Ms. Bauer stated that additional measures may be needed in the Plan. She added that a new base will be used for a revised Plan. Ms. Bauer mentioned that it is unknown how the 53 measures in the Five Percent Plan will stack up against the new base. She commented that the tough part for this type of Plan is that there has to be at least five percent reductions in emissions until attainment is met, as measured at the monitors. Ms. Bauer indicated that all of the modeling in the Plan will have to be revised. She noted that ADEQ and the Governor's Agricultural Best Management Practices Committee will be working on the agricultural BACM and enforcement issues. Ms. Bauer added that the region will also need three years of clean data at all the monitors.

Ms. Bauer presented the timeline of PM-10 air quality actions. She stated that MAG submitted the Five Percent Plan for PM-10 on time by December 31, 2007. Ms. Bauer added that the Center for Law in the Public Interest warned EPA about their intention to file a lawsuit if they failed to act on the Plan. She mentioned that EPA did not take action as required under the Clean Air Act; therefore, the Center for Law in the Public Interest filed a lawsuit in December 2009. Ms. Bauer noted the timeline of when EPA intends to go final with the action. She commented that by the time EPA takes some type of action on the Plan, it will be over three years that EPA has had this Plan.

Ms. Bauer again thanked the Committee, State, and the private and public sectors for their work on the Plan. She added that this Plan was a huge effort which was submitted in a timely manner. Ms. Bauer indicated that MAG does disagree with EPA on those four high wind exceptional events. She noted that MAG also believes that the Plan is effective.

Ms. McGennis commented on the conformity freeze and additional projects. She inquired if most of the projects have to go through conformity. Ms. Bauer responded that major projects such as adding lanes to arterials or freeways, new freeways, and other major projects generally have to go through conformity. Ms. McGennis inquired about projects that are related to maintenance or overlays. Ms. Bauer responded that there is a list of smaller projects that are exempt from conformity which would be able to proceed during a conformity freeze.

Steve Trussell, Arizona Rock Products Association, inquired if EPA approved Senate Bill 1552 in its entirety. Ms. Bauer responded that it does not appear that EPA approved Senate Bill 1552 in its entirety; however, they did approve a list of 20 measures. She added that the memo written to the Committee and included in the agenda packet contains an attachment listing the 20 measures that were approved by EPA. Ms. Bauer noted that EPA proposed approval of the measures in a different fashion, they proposed approval of the statutes. She added that the notice had a table with the measure number and the statutes. Ms. Bauer indicated that MAG compiled the measures associated with the Arizona Revised Statutes proposed for approval by EPA. Mr. Trussell inquired if there is a possibility of going back to the Arizona Legislature to fix Senate Bill 1552. He asked if there were parts of the Bill that were not approved by EPA that will have to be corrected. Ms. Bauer responded that EPA did not disapprove parts of Senate Bill 1552. She stated that EPA pulled some of the measures in the Plan that were tied to Senate Bill 1552, proposed approval, and listed the statutes.

Mark Hajduk, Arizona Public Service Company, commented on the measures from Senate Bill 1552 that were approved by EPA and inquired if those measures can be used for reductions in the new analysis. Ms. Bauer clarified that EPA has proposed approval. She added that the proposed approval does not mean that we will not be able to use those measures. Ms. Bauer added that these measures have benefits going through time. She noted that under the Clean Air Act, one plan builds upon another; therefore, these measures can be used since many of them have continuing benefits over time. Mr. Hajduk mentioned the 2008 inventory and inquired if the emission reductions that took place during that time will be able to be used towards the new inventory. Ms. Bauer responded that all of the numbers will change since EPA is proposing to disapprove the 2005 emissions inventory. Ms. Bauer noted that the economy has changed a great deal from 2005. She indicated that the County has a new 2008 inventory that may be used as a base; however, EPA may have some suggestions or additional comments for the new inventory. She commented that it is uncertain whether the inventory is totally final at this time. Ms. Bauer noted that the numbers will change regardless of the inventory that will be used.

Oddvar Tveit, City of Tempe, mentioned the emissions inventory and EPA's comment on the overestimation of construction. He inquired if this is a technical disagreement. Ms. Bauer responded that the emissions inventory is a technical piece of the Plan. She added that with regard to rule effectiveness, the County used a different methodology for the 2008 emissions inventory which will hopefully assist in addressing the issue EPA had with the 2005 emissions inventory. Ms. Bauer indicated that the total 2008 emissions in the inventory are much less than 2005 and very close to what was projected for 2010 in the Five Percent Plan. She added that this is another indication that the Plan

has been working to reduce emissions. Ms. Bauer noted that the percentages in the inventory have changed. She mentioned the lower percentages in residential construction, road construction, and commercial construction. Ms. Bauer commented that the biggest change in the inventories were the windblown dust pieces. She stated that the County applied a new methodology that is more accurate for the windblown piece. Ms. Bauer noted that there are measures in place that address windblown dust. She indicated that when MAG assesses the impacts of the measures, some will have a big impact while others will have a smaller impact. Ms. Bauer commented that Maricopa County has also indicated that compliance has increased a great deal since the 2007 Plan was completed, which increases rule effectiveness. She credited the private sector and governmental entities that complied with those rules.

Ms. Fish inquired if EPA assigned new numbers to each of the pieces of the pie since they had issues with the 2005 inventory. She asked if the County will have to redo the 2005 inventory or will they be able to move forward with the new 2008 inventory. Ms. Bauer responded that EPA has indicated their intention to disapprove the 2005 inventory. She added that the County has prepared the new 2008 inventory using a methodology that EPA favors which uses a larger base for the rule effectiveness. Ms. Bauer indicated that the County believes that the 2008 inventory is an improvement including the windblown dust category. She mentioned that once the 2008 inventory is ready, it will be used to move forward with the projections for the revised Plan. Jo Crumbaker, Maricopa County Air Quality Department, stated that the questions asked by Ms. Fish are similar to those that the County has asked to EPA. She added that the County is still awaiting the answers and will share the information once there is a clear understanding.

Larry Person, City of Scottsdale, stated that the presentation discussed the importance of the emissions inventory since it is the starting point. He added that he characterizes the 2005 emissions inventory as a growth area emissions inventory since there was a lot of construction and growth activity in the region at that time. Mr. Person commented that the 2008 inventory seems to be moving more in a direction of a recession type of inventory, an area with no growth. He indicated that long term, he does not believe the 2008 inventory reflects the reality in this region. Mr. Person mentioned that he feels that once the recession is over, the inventory will look more like the 2005 inventory. He added that maybe the inventory will not go as far with the construction pieces but likely similar to the 2005 inventory in many ways. Mr. Person noted that the 2005 inventory is more characteristic of this region. He inquired how to characterize the emissions inventory that EPA wants this region to provide. Mr. Person asked if the emissions inventory should reflect who we are as a region or one that reflects the technical critique of this Plan. Ms. Bauer responded that the periodic emissions inventory is a snapshot in time. She added that this is the reason that the Clean Air Act requires that an inventory be completed every three years. Ms. Bauer commented that there are constant changes. She noted that the 2005 inventory was prepared during a robust time; however, EPA has mentioned that their issue is with the rule effectiveness calculation that impacted the pieces of the pie.

Ms. Bauer added that now the County has prepared the 2008 emissions inventory. She stated that the County has used a broader base for the rule effectiveness study and it is another snap shot in time. She added that the County has also used a rule effectiveness methodology that EPA seems to like. Ms. Bauer noted that methodologies change as well. She indicated that the emissions inventories are important since they are the foundation for a plan. Ms. Bauer mentioned that the Clean Air Act states that the inventory should be comprehensive and accurate since the goal is to address sources and emissions to clean up the air. She commented that EPA is saying they have an issue with the rule

effectiveness which consequently resulted in an over estimation of construction emissions. Ms. Bauer stated that the new inventory has improved and also includes the windblown dust category. She added that the County has used a different approach. Ms. Bauer noted that the models also change. She discussed the modeling that its performed at MAG and added that EPA is always changing the models and making improvements. Mr. Person commented that if EPA would have made a determination on the Plan in March 2008, he believes they would have found the 2005 inventory to be current and accurate. He added that the three plus year delay by EPA is partly at fault for disapproval of the 2005 emissions inventory.

Mr. Person inquired if the County was directed by EPA to use the methodology that was subsequently used to determine rule effectiveness since it was an issue in the past. Mr. Person asked if EPA provided guidance at that time that is different than what is being presented. Ms. Crumbaker responded that EPA had the County commit to perform the rule effectiveness study. She added that their guidance has changed somewhat, though not completely over time, which is a complication that the County will have to deal with. Ms. Crumbaker indicated that EPA reviewed rule effectiveness at that point in time and had no comments which is probably one of the points that the County will be making to EPA.

Scott Bouchie, City of Mesa, referred to the timeline in the presentation and inquired about when the 2008 inventory will be ready. He added that he is thinking ahead in regards to the work that will need to be done considering the time and effort that was spent developing the Five Percent Plan for PM-10. Mr. Bouchie asked if work will begin in 2011 after the action has been finalized by EPA or if the Committee can begin to work on the next steps. Ms. Bauer responded that MAG needs answers from EPA as soon as possible. She added that MAG asked EPA questions long before the proposed action on the Plan was published. Ms. Bauer commented that MAG inquired about the issues and EPA responded that they could not talk to MAG until after the notice was signed. She indicated that time is of the essence since there is a great deal of work that has to be done. Ms. Bauer commented that MAG has posed some questions to EPA and shared them with Maricopa County, ADEQ, and others. She added that EPA has indicated that they will look at the questions and get back to MAG with some answers. Ms. Bauer noted that the County may also have some additional questions for EPA. Ms. Crumbaker added that most of the questions are subsets of questions that were submitted by MAG; therefore, Maricopa County has decided not to submit them to EPA.

Mr. Hajduk stated that according to the preamble, the rule effectiveness was 51 percent based on 63 inspections. He added that in 2010, Maricopa County reevaluated the rule effectiveness based on 11,000 inspections which resulted in 68 percent for Rule 310. Mr. Hajduk inquired if this was accurate. Ms. Crumbaker responded that this was one of the differences in methodology. She added that it was an approximate number of 64 percent. Ms. Crumbaker noted that the full 11,000 inspections are not random and include complaints, drive-by, and reinspections. She indicated that the inspections do no represent the full level two inspections that were completed under the other methodology. Ms. Crumbaker mentioned that there are distinct differences between the datasets. She added that if the inspections numbers are reapplied, assuming that they are in compliance on the return visit, it will actually generate a number of 66.7 percent, which is close to the 64 percent.

Mr. Hajduk inquired if the new methodology was done as a result of EPA requesting Maricopa County to do it. Ms. Crumbaker responded that the new methodology was used by the County to see what differences the two methods would generate. Mr. Hajduk asked if it was internally driven. Ms. Crumbaker responded yes and added that when the methodologies change, you want to see what

impacts the change may cause. She added that EPA released a new guidance when the County was working on the last study. Ms. Crumbaker noted that at some point in time, the newer guidance will have to be used. Mr. Hajduk stated that it seems unfair to use a methodology and guidance that was approved in 2010 on 2005 data when at that time it was not available even though the data was there. Ms. Crumbaker clarified that the methodology was approved in 2005 as the County was preparing the study. She added that the County did a protocol and started the study. Ms. Crumbaker noted that the other methodology is still allowed under that guidance; however, EPA was urging it and it was more comprehensive than the prior guidance. Mr. Hajduk stated that it seems that the County used proper protocol and the right methodology at the time which has now changed since EPA is looking at it five years later. He added that this should be a comment that is made to EPA. Ms. Crumbaker responded that the County will be making this comment to EPA. She added that the methodology was allowable at the time that it was used. Ms. Crumbaker noted that the methodology is still allowable and not precluded under the current guidance.

Mr. Person stated that there were 11 exceedances in 2008 including four that EPA would not consider exceptional events making the data in 2008 not clean. He mentioned his concern of not getting those exceedances declared as exceptional events. Mr. Person added that according to EPA, there are 17 exceedances in 2009 that we are trying to have declared as exceptional events. However, if the issue is not fixed for 2008, then the region may not have a chance of having clean data in 2009. Ms. Bauer responded that this is exactly the point MAG is making. She added that EPA has admitted that the Exceptional Events Rule is flawed and that there are issues with implementation. Ms. Bauer indicated that EPA has been working with WESTAR, and WESTAR has been working with EPA very aggressively along with the National Association of Clean Air Agencies. She mentioned that ADEQ has been participating since they know there are issues with the Exceptional Events Rule. Ms. Bauer commented that MAG has been involved in working with ADEQ to help provide additional information to EPA. She stated that MAG does agree that the issue will remain with the region until the Exceptional Events Rule is fixed since the high wind events in the region cannot be controlled. Ms. Bauer stated that according to Maricopa County and ADEQ there are seven days of exceedances in 2009.

Ms. Arnst stated that there is a meeting at WESTAR next week where Janet McCabe, EPA, will be attending and responding in part to the letter from WESTAR about fixing the Exceptional Events Rule. She added that there should be some information from that meeting that provides a sense of direction from EPA, how quickly they will be providing guidance on how to implement the rule, or actual revisions to the rule.

Mr. Hajduk discussed a presentation that was provided by Colleen McKaughn, EPA. He added that she described an exceedance at the West 43<sup>rd</sup> Avenue monitor stating it was not a "storm." Mr. Hajduk noted that the verbiage MAG is using is "wind events." He added that there is a big difference between a wind event and a storm and he is not sure if EPA is seeing that difference. Mr. Hajduk inquired if that is the frustration that MAG is dealing with. Ms. Bauer responded yes. She mentioned an article in the *MAGAZine* and added that MAG attempted to clarify the difference with pictures that were obtained from ADEQ. Ms. Bauer commented that the Exceptional Events Rule addresses exceptional events at a single monitor. She added that the region has dust devils that occur in the desert that could cause a monitor to go over and are not dust storms. Ms. Bauer discussed surface roughness, high winds coming from the west and southwest, moving over a smooth terrain and picking up dust, dry silky soils in that area and hitting the monitor. However, when the dust travels further down wind into the urbanized areas, the winds slow down as it runs into the buildings, causing

particles to drop out which eventually makes the concentrations less. Ms. Bauer added that MAG is frustrated since a lot has to do with surface roughness. She indicated that the EPA Exceptional Events Rule does allow for exceptional events at a single monitor. In fact, EPA has made that argument when other environmental groups have questioned them on various exceptional events.

Mr. Hajduk commented that Ms. McKaughn's rebuttal to that is that the information submitted at the time addressed the exceedance as a dust storm and not a localized wind event. He added that EPA stated that they were going off the information that was presented at the time. Mr. Hajduk inquired if the additional information submitted clarified that issue. Ms. Bauer responded that the additional information submitted to EPA by MAG and ADEQ clarifies the issue. She noted that a great deal of additional information has been submitted to EPA. Ms. Bauer encouraged the Committee to take a copy of the *MAGAZine* and added that pictures are included of one of the days in question.

Mr. Trussell commented on the issue of high winds. He inquired if the winds at the West 43<sup>rd</sup> Avenue monitor were characterized as within or above the 95<sup>th</sup> percentile. Ms. Bauer responded yes, they were unusually high winds. She added that the MAG consultant, Sierra Research, completed that analysis. Mr. Trussell inquired if this information was originally submitted and dismissed or if it was supplemental information. Ms. Bauer responded that she believes it was part of the supplemental information.

Ms. Arnst stated that the initial submittals had a chart that was created with a pink color over the hours that were in the top five percent of historical frequency. She added that there were questions by the reviewers of EPA and they were not understanding how the information was presented. Therefore, the supplemental information included a more narrative form. She mentioned that WESTAR has commented that there are two things in the Exceptional Events Rule that are not in the Clean Air Act that need to come out of the rule. Ms. Arnst added that one of those items is the demonstration of historical frequency and the other is "but for this event, an exceedance would not have happened." She mentioned that it will be interesting to see what Ms. McCabe has to say about that issue.

Ms. Fish stated that she has seen the information compiled by ADEQ to be submitted to EPA on the exceptional events. She added that the information is very thorough with a great deal of information from not only the Valley monitors but from weather stations throughout the State. Ms. Fish noted that the information included pictures taken from the various monitors. She indicated that there is a lot of good information and presented in a concise manner. Ms. Bauer added that ADEQ has done an excellent job with the exceptional events.

Mr. Person commented on the consequences of Plan disapproval action. He mentioned the conformity freeze and inquired when the sanctions clock will turn off. Ms. Bauer responded that the language for a conformity freeze is out of the federal conformity regulations. She stated that the plan does not have to be approved. Ms. Bauer mentioned that if EPA has some level of comfort with the plan that was submitted, EPA could give an adequacy finding on the conformity budget within 90 days of when the plan was submitted. She indicated that EPA will put it out for public review and then the conformity budget can be used. Ms. Bauer added that another way of receiving an approved conformity budget is by EPA approving the plan.

Mr. Hajduk stated that it seems that EPA, MAG and ADEQ are going to agree to disagree on the exceptional events issue. He inquired if there are plans for legal action. Ms. Bauer responded that the MAG Regional Council is very concerned with this issue. She added that MAG staff has been directed

to work with the MAG Regional Council Executive Committee. Ms. Bauer noted that the Executive Committee has authorized MAG to have legal counsel. She mentioned that MAG has hired Roger Ferland from Quarles and Brady in Phoenix, Arizona; Patton and Boggs, Washington D.C.; and Crowell and Moring, Washington D.C. She added that all options are under consideration.

Mr. Trussell stated that Imperial Valley is in a similar situation. He asked if there is anything that could be learned or efforts to be joined regarding the Exceptional Events Rule. Ms. Bauer responded that MAG had a conference call with Imperial Valley and MAG's legal counsel has also been in close contact with Imperial. She added that the Board of the Imperial County Air Pollution Control District authorized legal action as necessary.

Mr. Kamps inquired about the next steps. Ms. Bauer responded that MAG staff will be reporting back to the Committee. She added that the questions submitted to EPA need to be answered. Ms. Bauer indicated that MAG will need to address the Plan and the criticism from EPA. In addition, MAG, Maricopa County, and ADEQ will be submitting comments on the proposed action to EPA. She noted that the information will be shared with the Committee. Ms. Bauer mentioned that once EPA approves the base for a revised plan, all of the measures in place will be analyzed to see how far out those benefits extend. She commented that MAG will share the information with the Committee and gather input. Mr. Kukino thanked Ms. Bauer for the update.

6. EPA Delays Release of Final Ozone Standards

Ms. Bauer stated that EPA has delayed the new revised eight-hour ozone standard until the end of October 2010. EPA had originally intended to announce the new standard by August 31, 2010.

7. Call for Future Agenda Items

Mr. Kukino announced that the next meeting of the Committee has been tentatively scheduled for Thursday, October 28, 2010 at 1:30 p.m. Ms. Fish stated that EPA is proposing a change to the National Ambient Air Quality Standard for PM-10 to reduce the standard from the current 150 micrograms per cubic meter to 75 micrograms per cubic meter. She requested that a presentation be provided on the impacts that this change will have on the region. Mr. Trussell seconded the request and added that the Committee would have to know what else they are going to deal with as the plan revision is prepared. With no further comments, the meeting was adjourned at 2:34 p.m.



October 4, 2010

Mr. Jared Blumenfeld  
Regional Administrator  
Region IX  
Environmental Protection Agency  
75 Hawthorne Street  
San Francisco, CA 94105-3901

RE: Docket No. EPA-R09-OAR-2010-0715

Dear Regional Administrator Blumenfeld:

On September 9, 2010, the Environmental Protection Agency ("EPA") proposed to approve in part and disapprove in part State Implementation Plan ("SIP") revisions submitted by the State of Arizona with regard to the Maricopa County nonattainment area for particulate matter of ten microns or less ("PM-10").<sup>1</sup> In that notice, EPA, among other things, proposed: (1) to disapprove provisions of the Clean Air Act ("CAA") section 189(d) plan for the Maricopa area because they allegedly do not meet applicable CAA requirements for emissions inventories, 5% annual emission reductions, reasonable further progress, and contingency measures; (2) to disapprove the 2010 motor vehicle emissions budget in the 189(d) plan as not meeting the requirements of CAA section 176(c) and 40 C.F.R. § 93.118(e)(4); (3) limited approval and limited disapproval of State regulations for the control of PM-10 from agricultural sources; and (4) to approve various provisions of State statutes related to the control of PM-10 emissions in the Maricopa area.

As you know, these are complicated issues that the State of Arizona, Maricopa Association of Governments ("MAG"), EPA, and others have been working on for many years. Despite the breadth and complexity of both the State's SIP revisions and EPA's proposed disposition, however, the agency has provided a comment period of only 33 days, or until October 12, 2010. This comment period is insufficient given the complexity and importance of the SIP revisions.

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<sup>1</sup> 75 Fed. Reg. 54,806 (September 9, 2010).

EPA's review of the MAG Five Percent Plan for PM-10 is far too important to the people and economy of Arizona to be subject to an arbitrary deadline established without the input of the State. We have submitted questions to EPA regarding the proposed disapproval that, if answered, would better inform our public comments. We have not yet heard back from EPA on these important questions. While we support prompt resolution of this matter and commit to working diligently with EPA, we are concerned that EPA's current deadlines will limit public input, reduce discussion and information exchanges between EPA, the State, MAG, and other stakeholders, and effectively leave EPA with little choice but to finalize its proposed partial denial.

To ensure that there is adequate time for interested stakeholders to comment meaningfully on EPA's proposal and for the agency to complete the difficult task of thoroughly reviewing all of the docketed information, we respectfully request a comment period extension of 60 days.

Thank you for your consideration of this important request. If we can provide any additional information in this matter, please do not hesitate to contact us directly.

Sincerely,



Benjamin H. Grumbles  
Director  
Arizona Department of  
Environmental Quality



Dennis Smith  
Executive Director  
Maricopa Association of Governments

cc: The Honorable Lisa Jackson  
Administrator  
U.S. Environmental Protection Agency

Ms. Gina McCarthy  
Assistant Administrator  
Office of Air and Radiation

## ARIZONA'S RECOMMENDED CLARIFICATIONS TO THE EXCEPTIONAL EVENTS RULE

Representatives of the State of Arizona participated in the September 2, 2010 EPA call with other state and local governments to discuss what the agency characterized as "Ideas for Improvement" as far as the implementation of the Exceptional Events Rule (72. Fed. Reg. 13560; March 22, 2007) (the "EER"). As a member of WESTAR, Arizona strongly supports the September 11, 2009 recommendations from WESTAR, as well as those from the California Air Resources Board as to how the implementation of the EER might be improved. In addition, based upon our extensive experience in attempting to understand and comply with the requirements of the EER, we would recommend that EPA act to clarify the EER in three critical respects.<sup>1</sup>

### 1. Process

Neither Section 319 of the Clean Air Act ("CAA") nor the EER sets forth a procedure for a State to follow when it submits "appropriate documentation" for an exceptional event demonstration or the procedure to be followed by EPA when it considers that documentation. Apparently a specific procedure was felt to be unnecessary in the rules because the documentation package would only be submitted after extensive "collaboration" and "consultation" had occurred between the State and EPA. In the preamble to the EER, the critical role played by consultation and collaboration in the consideration of exceptional events documentation is mentioned on five occasions. Indeed, in response to a comment that EPA establish an appellate process when regional EPA offices fail to concur with a demonstration, EPA responded that such a process was unnecessary "because we anticipate that the States and Regional Offices will be working closely through the data and documentation submission process." 72 Fed. Reg. at 13574. It is the State's experience that if the consideration of exceptional events demonstration is to produce a predictable and consistent result, there must be a more formalized, structured and streamlined procedure for consideration of exceptional events by the regional offices and the procedure must explicitly require EPA to engage in consultation and collaboration with the States at every stage prior to submission. Also, the procedure must require that there be an administrative record upon which the regional offices must rely and because the EER requires that a weight of evidence approach be applied, the record must contain the totality of the information on which the determination is based and EPA must specify the elements of the record on which its decision was based.<sup>2</sup>

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<sup>1</sup> All of our recommendations are based on either the language of Clean Air Act Section 319, the EER and its Preamble or implementation of the EER from EPA determinations in the Federal Register.

<sup>2</sup> As prescribed by the EER and its preamble, the State believes that the following are the steps in the exceptional event decision process:

**Prior to Submission:**

Exceptional Event Identification  
Exceptional Event Documentation Development  
Public Comment

2. **The Information Necessary to Demonstrate that Anthropogenic Sources are “Reasonably Well-Controlled” at the Time that the Event Occurred.**

The level and nature of the documentation necessary to demonstrate that anthropogenic sources are reasonably well-controlled as required by CAA section 319(b)(1)(A)(ii) and the EER at 40 C.F.R. § 50.1(j), must be specifically set forth in guidance. From EPA’s determinations on past exceptional events demonstrations, there are several principles that the State believes should be incorporated in guidance:

- In keeping with the predecessor to the EER, EPA’s Natural Events Policy, that was relied upon by Congress when CAA section 319 was amended, if a State has what EPA has determined are Best Available Control Measures in place and the means and commitment to enforce them, it should be presumed that the anthropogenic activities to which the measures applied are reasonably controlled;
- Exceptions to this presumption exist if there were unusual emissions as far as nature or extent linked to anthropogenic activities that were observed during that period.<sup>3</sup>

The guidance should also stress that States making the demonstration should not have to show that sources upwind of an affected monitor were “actually controlled,” since such a showing, particularly in an urban environment, is a “practical impossibility.” *Id.* 73 Fed. Reg. at 14692.

3. **Demonstrating the Clear Causal Relationship Between the Measurement Under Consideration and the Event Claimed to have Affected the Air Quality in the Area.**

The guidance should state that the clear causal relationship demonstration required by CAA section 319 need only be shown for the “particular air quality monitoring location” at which the measurement occurred. This is what is explicitly required in both CAA section 319(b)(3)(B)(ii) and the EER at 40 C.F.R. § 50.14(c)(3)(iii)(A). Thus, while information about the temporal and spatial extent of an event is relevant to the demonstration of causality (*see* 72 Fed. Reg. at 13573) and may

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**Post Submission:**

Completeness Determination  
State Responses Correcting Deficiencies  
EPA Exceptional Event Documentation Development  
Public Comment Prior to Decision

<sup>3</sup> *See* generally the analysis of these principles in EPA’s approval of the San Joaquin Valley PM-10 nonattainment area exceptional events demonstration at 73 Fed. Reg. 14687 at 14687, 14691 and 14693 (March 19, 2008).

help determine the overall magnitude of the event, the clear causal relationship criterion need only be demonstrated for the monitor(s) that actually were affected by the event.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION IX  
75 Hawthorne Street  
San Francisco, CA 94105-3901

October 7, 2010

OFFICE OF THE  
REGIONAL ADMINISTRATOR

Benjamin H. Grumbles, Director  
Arizona Department of Environmental Quality  
1110 West Washington Street  
Phoenix, AZ 85007

Dennis Smith, Executive Director  
Maricopa Association of Governments  
302 North 1st Avenue, Suite 300  
Phoenix, AZ 85003

Re: Response to Comment Period Extension Request

Dear Mr. Grumbles and Mr. Smith:

I have received your October 4, 2010 letter requesting a 60-day extension of the public comment period for EPA's September 9, 2010 (75 FR 54806) proposed action on certain revisions to the Arizona state implementation plan related to PM-10 in the Maricopa County (Phoenix) nonattainment area.

Due to a consent decree deadline of January 28, 2011 for a final rule (in *Bahr v. Jackson*, U.S. District Court, District of Arizona), and leaving sufficient time for EPA to respond to comments, I cannot grant your request for a 60-day extension. I am, however, granting an extension of the public comment period to October 20, 2010. Soon we will publish notice of the extension in the Federal Register. Your letter also refers to questions that you submitted to EPA regarding the proposed action. My staff are working to respond as quickly as they can.

Thank you for your continued commitment to solving the air quality problems in the greater Phoenix area.

Sincerely,

A handwritten signature in black ink, appearing to read "Jared Blumenfeld".

Jared Blumenfeld  
Regional Administrator

HARRY E. MITCHELL

11th District, Arizona

1415 E. McDowell House Office Building  
Washington, DC 20515  
PH: 202-225-2190

7201 E. Camelback Road, Suite 350  
Scottsdale, AZ 85261  
PH: 480-946-2411  
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**Congress of the United States**  
**House of Representatives**

COMMITTEE ON TRANSPORTATION  
AND INFRASTRUCTURE

SUBCOMMITTEE ON AVIATION  
SUBCOMMITTEE ON HIGHWAYS AND TRUCKS  
SUBCOMMITTEE ON  
WATER RESOURCES AND ENVIRONMENT

COMMITTEE ON VETERANS' AFFAIRS

CHAIRMAN  
SUBCOMMITTEE ON  
OVERSIGHT AND INVESTIGATION

COMMITTEE ON  
SCIENCE AND TECHNOLOGY

SUBCOMMITTEE ON  
TECHNOLOGY AND INNOVATION

October 1, 2010

Gina McCarthy  
Assistant Administrator  
Office of Air and Radiation  
U.S. Environmental Protection Agency  
Mail code: 6101A  
1200 Pennsylvania Avenue NW  
Washington, DC 20460

Dear Assistant Administrator McCarthy:

I write to notify you that I will be convening a meeting next week to discuss the Environmental Protection Agency's (EPA) proposed rule on the PM-10 Nonattainment Area Plan for Maricopa County Arizona, and formally request that you attend this meeting. Representatives from the Maricopa Association of Governments (MAG), mayors from the region, officials from the Arizona Department of Transportation (ADOT) and the Arizona Department of Environmental Quality (ADEQ) will also be invited to attend and participate.

As you know, the EPA's proposed rule, the Approval and Promulgation of the Implementation Plans – Maricopa County (Phoenix) PM-10 Nonattainment Area; Serious Area Plan for Attainment of the 24-Hour PM-10 Standard; Clean Air Act Section 189(d) was published in the Federal Register on September 9, 2010.

However, interested parties only have until October 12, 2010 to submit any comments regarding this proposed ruling. Given the severe ramifications that this proposed ruling would have on Arizona should this ruling take effect, I believe that it is critical that state, county, and local stakeholders be given the opportunity to discuss this proposed ruling in-person, in a frank and candid manner before the comment period closes and the EPA works to finalize its ruling.

As a member of the House Committee on Transportation and Infrastructure and as a former mayor of Tempe, Arizona, I am deeply concerned about the impact the EPA's proposed ruling would have on our state.

According to the proposed ruling, should the EPA take final action disapproving Maricopa County's plan, a "conformity freeze" would take effect, under which new

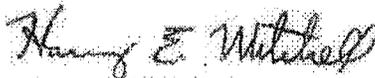
transportation projects would be halted in the Phoenix area. According to the Maricopa Association of Governments (MAG), this freeze would have serious consequences including blocking several projects from moving forward. In my Congressional district alone, this freeze would impact two critical projects: the construction of a streetcar in Tempe and the expansion of Light Rail in Mesa.

In addition to disputing the basis of the proposed ruling, I fail to comprehend how delaying vitally important transit projects, which could reduce the Valley's dependence on automobiles, would serve the EPA's goals. If anything, I would think the EPA would want to see these projects accelerated.

I strongly urge you to attend this meeting to discuss this critical issue and hear from stakeholders throughout Maricopa County. This meeting will occur on either Thursday, October 7 at 1:00 pm Arizona Time or Friday, October 8 at 10:00 am Arizona Time. Please contact my District Director, Robbie Sherwood, at (480) 946-2411 to discuss this request.

Thank you for your consideration.

Sincerely,



Harry E. Mitchell  
Member of Congress

Cc: Deputy Assistant Administrator Janet McCabe

October 20, 2010

Mr. Gregory Nudd (Air-2)  
U. S. Environmental Protection Agency Region IX  
75 Hawthorne Street  
San Francisco, CA 94105-3901

RE: Comments on Proposed Partial Approval and Disapproval of MAG 2007 Five Percent Plan for PM-10<sup>1</sup>  
Docket ID No. EPA-R09-OAR-2010-0715

Dear Mr. Nudd:

As the leaders of large and small communities across the Maricopa Association of Governments (MAG) region representing nearly four million residents, we have a significant interest in the proposed partial approval and partial disapproval of the MAG Five Percent Plan for PM-10. This action could prevent some transportation projects in the Maricopa region from moving forward and ultimately result in progressively dire economic sanctions for a region already devastated by the economic recession.

Foreclosure rates in the Phoenix metro area are at an all-time high, with nearly 60,000 distressed properties either already foreclosed or pending foreclosure. Almost 100,000 construction jobs have been lost in the region over the last three years. We can ill afford any action by the EPA that will cause further economic hardship to our residents. In fact, we have already seen a chilling effect on economic development as a result of media reports surrounding the proposed disapproval. Our region cannot afford a conformity freeze, or any of the additional sanctions that could be imposed if the EPA disapproves the Plan.

A conformity freeze would be especially unfair considering that our communities have implemented aggressive measures to address dust pollution and the fact that high wind exceptional events—which we believe are the cause of all but one of the exceedances at the monitors in 2008 and 2009—are outside of our control.

MAG, Maricopa County, and the Arizona Department of Environmental Quality have an impressive track record for improving the quality of our air. We were one of the first areas in the country to

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<sup>1</sup> 75 Fed. Reg. 54,806 (September 9, 2010).

implement an alternative fuels program to help resolve the carbon monoxide issue. We have one of the most stringent vehicle emissions inspection maintenance programs in the country. We are currently a cosponsor of a pilot project to implement electric vehicle charging stations in the region. We have met the federal air quality standard for carbon monoxide, and the nonattainment area is now a maintenance area. We are also a maintenance area for one-hour ozone; there have been no violations of that standard since 1996. There have been no violations of the .08 parts per million eight-hour ozone standard since 2004. Our region also meets the fine particulate standard (PM-2.5).

In the area of PM-10, the MAG Revised 1999 Serious Area Plan contained 77 aggressive measures to reduce dust. This Plan was one of the first in the nation and was heralded by the EPA as one of the most comprehensive plans in the country. The MAG Five Percent Plan for PM-10 contains another 53 aggressive measures that are in addition to the Serious Area Plan measures. In fact, every city and town within the nonattainment area, and Maricopa County, have implemented dust control measures to address dust pollution. Our tracking report indicates the cities and towns have gone above and beyond their commitments.

The MAG Regional Council has allocated a total of \$23.2 million in Congestion Mitigation and Air Quality (CMAQ) funds over the last 10 years to purchase clean, dust-reducing street sweepers. We have allocated \$28.4 million for paving unpaved roads from fiscal 2007 to 2013.

The bottom line is our region cares about the air our residents breathe. That is why we have taken aggressive action to protect public health. Our plan is effective and it is working. If EPA disapproves the MAG Five Percent Plan for PM-10, this action could result in unnecessary controls on industry, further hurting the economy and our residents. We think the stakes are high for our citizens and, although we appreciate the recent eight-day extension of the comment period, we believe that not enough time has been allowed for EPA fully to consider and respond to our concerns. Therefore, we continue respectfully to request that the EPA delay any decision regarding final disapproval action until the Agency has an adequate opportunity to review all of the scientific data MAG and ADEQ have provided regarding high-wind exceptional events, as well as the information that will be submitted on other elements of the proposed disapproval.

We continue to have significant concerns over the implementation and interpretation of the Exceptional Events Rule. The EPA has admitted that the exceptional events rule is flawed, and many states are concerned about inconsistencies in how it is administered. The rule is being questioned not only by Arizona, but also by 14 other western states that must frequently contend with dust storms, wildfires and forest fires. If this issue is not resolved, our region could find itself in the same situation again based on emissions that cannot be controlled—there is no plan that can stop or diminish high winds.

Despite our objections to the proposed disapproval, MAG is committed to making technical fixes to the plan that are necessary to ensure clean air for our citizens. We will continue to work with EPA to address the Agency's concerns and take action where necessary. As we have in the past, we will work in good faith and work with our regulatory partners, our member agencies, and the public to improve an air quality plan that will bring us to attainment. Our hope is that this will be a collaborative process and that we will be able to move forward in a way that will not harm our economy and the residents of Arizona.

Sincerely,

The Regional Council of the Maricopa Association of Governments



Thomas L. Schoaf  
Mayor, City of Litchfield Park  
Chair, MAG Regional Council



Hugh Hallman  
Mayor, City of Tempe  
Vice Chair, MAG Regional Council



Marie Lopez Rogers  
Mayor, City of Avondale  
Treasurer, MAG Regional Council



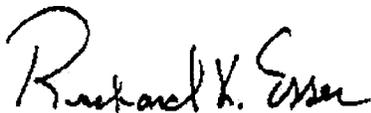
Robin Barker  
Councilmember, City of Apache Junction



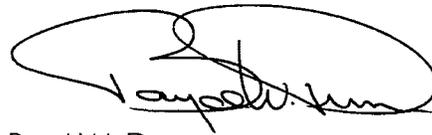
Jackie Meck  
Mayor, Town of Buckeye



David Schwan  
Mayor, Town of Carefree



Richard K. Esser  
Councilmember, Town of Cave Creek



Boyd W. Dunn  
Mayor, City of Chandler



Michele Kern  
Mayor, City of El Mirage



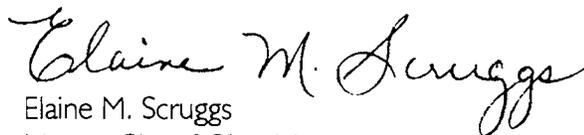
Jay Schlum  
Mayor, Town of Fountain Hills



Ron Henry  
Mayor, Town of Gila Bend



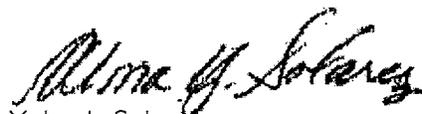
John Lewis  
Mayor, Town of Gilbert



Elaine M. Scruggs  
Mayor, City of Glendale



James M. Cavanaugh  
Mayor, City of Goodyear



Yolanda Solarez  
Mayor, Town of Guadalupe



Mary Rose Wilcox  
Supervisor, District 5, Maricopa County



Scott Smith  
Mayor, City of Mesa



Scott LeMarr  
Mayor, Town of Paradise Valley



Bob Barrett  
Mayor, City of Peoria



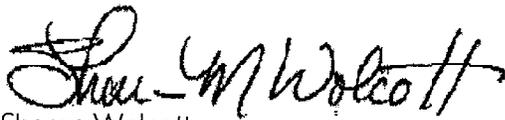
Peggy Neely  
Councilmember, City of Phoenix



Gail Barney  
Mayor, Town of Queen Creek



Jim Lane  
Mayor, City of Scottsdale



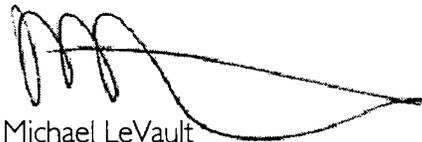
Sharon Wolcott  
Councilmember, City of Surprise



Adolfo Gamez  
Mayor, City of Tolleson



Kelly Blunt  
Mayor, Town of Wickenburg



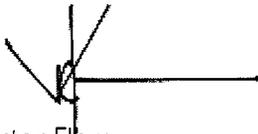
Michael LeVault  
Mayor, Town of Youngtown



F. Rockne Arnett  
Chair, Citizens Transportation Oversight  
Committee



Felipe Zubia  
Member, State Transportation Board



Victor Flores  
Member, State Transportation Board

cc: Jared Blumenfeld, EPA Region IX Administrator  
Deborah Jordan, EPA Region IX  
Colleen McKaughan, EPA Region IX  
Joy E. Herr-Cardillo, Arizona Center for Law in the Public Interest

# GILA RIVER INDIAN COMMUNITY

*Executive Office of the Governor & Lieutenant Governor*

*William R. Rhodes*  
Governor



*Joseph Manuel*  
Lieutenant Governor

October 18, 2010

Mr. Gregory Nudd (Air-2)  
U. S. Environmental Protection Agency Region IX  
75 Hawthorne Street  
San Francisco, CA 94105-3901

RE: Comments on Proposed Partial Approval and Disapproval of MAG 2007 Five Percent Plan for PM-10  
Docket ID No. EPA-R09-OAR-2010-0715

Dear Mr. Nudd:

Please accept this letter supporting Maricopa Association of Governments (MAG) on the U. S. Environmental Protection Agencies (EPA) proposed partial approval and partial disapproval of the MAG Five Percent Plan for PM-10.

Maricopa Association of Governments, Maricopa County, and the Arizona Department of Environmental Quality have an impressive track record for improving the quality of air throughout the region. In the area of PM-10, the MAG Revised 1999 Serious Area Plan contained 77 aggressive measures to reduce dust. This Plan was one of the first in the nation and was heralded by the EPA as one of the most comprehensive plans in the country. The MAG Five Percent Plan for PM-10 contains another 53 aggressive measures that are in addition to the Serious Area Plan measures. In fact, every city and town within the nonattainment area, and Maricopa County, have implemented dust control measures to address dust pollution. In addition, the Gila River Indian Community has also developed the first comprehensive Air Quality Management Plan (AQMP) in Indian Country which includes numerous regulatory measures to control dust pollution.

The Gila River Indian Community has expressed many of the same concerns as MAG, Maricopa County and Arizona Department of Environmental Quality over the implementation and interpretation of the federal Exceptional Events Rule. The EPA has admitted that the exceptional events rule is flawed, and many states are concerned about inconsistencies in how it is administered. Since PM-10 designations for GRIC, MAG, Maricopa County and much of the State are directly dependant on EPA's concurrence/non-concurrence with each jurisdiction's Exceptional Events Evaluation,

EPA should first correct the flawed Exceptional Events Rule prior to making any decisions on concurrence /non-concurrence under the Rule. The rule is being questioned not only by Arizona, but also by 14 other western states and Tribes that must contend with dust storms, wildfires and forest fires. If this issue is not resolved, our region could find it in the same situation in future years based on emissions that cannot be controlled—there is no plan that can stop or diminish high winds.

As a member of the Maricopa Association of Governments, we wish to extend our support in their efforts to attain the PM-10 National Ambient Air Quality Standard (NAAQS) and continued protection of public health.

We also wish to express our appreciation to the U. S. EPA for their efforts to provide assistance to the Gila River Indian Community to address exceptional events as they pertain to Tribal Governments.

Please feel free to contact Margaret Cook at Department of Environmental Quality for any additional information at (520) 562-2234.

Sincerely,

A handwritten signature in black ink, appearing to read 'W. R. Rhodes', with a date '10-18-10' written below it.

William R. Rhodes, Governor  
Gila River Indian Community

Cc: Nathan B. Pryor  
Intergovernmental Policy Coordinator



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October 20, 2010

VIA ELECTRONIC AND OVERNIGHT MAIL

Mr. Gregory Nudd (Air-2)  
U. S. Environmental Protection Agency Region IX  
75 Hawthorne Street  
San Francisco, CA 94105-3901

RE: Docket ID No. EPA-R09-OAR-2010-0715  
Maricopa Association of Governments' Comments on the "Approval and  
Promulgation of Implementation Plans—Maricopa County (Phoenix) PM-10 for  
Attainment of the 24-Hour PM-10 Standard; Clean Air Act Section 189(d)"

Dear Mr. Nudd:

Please find attached the comments from the Maricopa Association of Governments ("MAG") on the "Approval and Promulgation of Implementation Plans—Maricopa County (Phoenix) PM-10 for Attainment of the 24-Hour PM-10 Standard; Clean Air Act Section 189(d)" to be filed this date in Docket No. EPA-R09-OAR-2010-0715. MAG represents the 25 cities and towns in Maricopa County, Arizona, and the contiguous urbanized area, three Native American Indian Communities, and Maricopa County. MAG serves as the designated Regional Air Quality Planning Agency for the Maricopa area.

On September 9, 2010, the Environmental Protection Agency ("EPA") proposed to approve in part and disapprove in part State Implementation Plan ("SIP") revisions submitted by the State of Arizona with regard to the Maricopa County nonattainment area for particulate matter of ten microns or less ("PM-10").<sup>1</sup> The "MAG 2007 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area" (the "Plan") that is the subject of the Proposed Action was developed by MAG in concert with the Arizona Department of Environmental Quality and Maricopa County.

In the Proposed Action, EPA, among other things, proposed: (1) to disapprove the State's attainment demonstration, five percent emission reduction plan, contingency measures, reasonable further progress and milestone demonstration, and Motor Vehicle Emissions Budget ("MVEB") based on a rejection of the State's Exceptional Events Demonstration; (2) to disapprove the 2005 Emissions Inventory and the 2010 MVEB in the Plan; (3) to allow limited approval and limited disapproval of State regulations for the control of PM-10 from agricultural sources; and (4) to approve various provisions of State statutes related to the control of PM-10 emissions in the Maricopa area.

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<sup>1</sup> 75 Fed. Reg. 54,806 (September 9, 2010).

A Voluntary Association of Local Governments in Maricopa County

City of Apache Junction ▲ City of Avondale ▲ Town of Buckeye ▲ Town of Carefree ▲ Town of Cave Creek ▲ City of Chandler ▲ City of El Mirage ▲ Fort McDowell Yavapai Nation ▲ Town of Fountain Hills ▲ Town of Gila Bend  
Gila River Indian Community ▲ Town of Gilbert ▲ City of Glendale ▲ City of Goodyear ▲ Town of Guadalupe ▲ City of Litchfield Park ▲ Maricopa County ▲ City of Mesa ▲ Town of Paradise Valley ▲ City of Peoria ▲ City of Phoenix  
Town of Queen Creek ▲ Salt River Pima-Maricopa Indian Community ▲ City of Scottsdale ▲ City of Surprise ▲ City of Tempe ▲ City of Tolleson ▲ Town of Wickenburg ▲ Town of Youngtown ▲ Arizona Department of Transportation

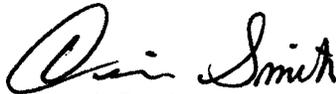
October 20, 2010

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Although MAG agrees with EPA's approval of various provisions in State statute relating to control of PM-10 emissions in the Maricopa area, MAG disagrees with EPA's proposed disapproval of the other provisions of the Plan as explained in detail in our comments. MAG is aware that both the Arizona Department of Environmental Quality and the Maricopa County Air Quality Department have submitted comments. We have worked diligently with our regulatory partners, our member agencies, and the public to develop a Plan that will address PM-10 emissions in the Maricopa area and bring the Maricopa area to attainment. MAG's Revised 1999 Serious Area Plan was one of the first in the nation and was heralded by EPA as one of the most comprehensive plans in the country. The PM-10 Plan submitted by MAG in 2007 that is the subject of EPA's current proposed action contained additional aggressive dust control measures. In fact, every city and town within the nonattainment area, and Maricopa County, have implemented dust control measures and have gone above and beyond their commitments to control PM-10 emissions.

We trust that EPA will carefully consider our comments, as well as the comments of industry groups and our regulatory partners, in making its decision on the proposed action. We appreciate the opportunity to comment on EPA's proposed action. Thank you for your attention.

Sincerely,

A handwritten signature in black ink that reads "Dennis Smith". The signature is written in a cursive, flowing style.

Dennis Smith

Executive Director

Maricopa Association of Governments

**MAG Comments on Docket ID Number EPA–R09–OAR–2010–0715,  
“Approval and Promulgation of Implementation Plans–Maricopa County (Phoenix)  
PM–10 Nonattainment Area; Serious Area Plan for Attainment of the 24-Hour PM–10  
Standard; Clean Air Act Section 189(d)”**

**EPA Comments, 75 FR 54808-54809:**

*“The 2005 Periodic Inventory is not sufficiently accurate for the purposes of the 189(d) plan. As discussed below, this inventory and the subsequent year inventories that MAG derived from it overestimate the baseline emissions from construction and other sources...EPA believes that analysis of the full database of 11,000 Rule 310 inspections provides a more accurate measure of rule effectiveness than using a sample of 63 inspections. This is because the 63 inspections may not be representative of the entire population of sources covered by the rule. The larger data set is much more likely to be free of sample biases. Therefore, based upon this analysis, EPA has determined that the initial estimate of rule effectiveness for Rule 310 was not accurate. There is a similar inaccuracy in the rule effectiveness calculations for MCAQD Rule 310.01 for unpaved parking lots, unpaved roads and similar sources of fugitive dust emissions.”*

**MAG Response:**

There are several problems with EPA’s above statement:

**(1) The methodology used by Maricopa County Air Quality Department (MCAQD) does not conflict with any existing or previous Rule Effectiveness (RE) guidance issued by the EPA. In fact, the methodology used by MCAQD in the 2005 Periodic Inventory applied the principles of EPA’s current and previous guidance documents in developing the RE studies. It is important to note upfront that EPA does not state that it finds the RE methodology used in the 2005 Periodic Inventory conflicts with, or runs contrary to EPA guidance on the development of RE studies. EPA simply argues it prefers the method developed by MCAQD in 2010 over the method used in the 2005 Periodic Inventory because it may help to eliminate sample bias. EPA even acknowledges that the 2010 analysis conducted by MCAQD was not a strict formulation in response to current EPA guidance but rather it “was a hybrid of a simple average of the results in the inspection database and the 2005 Emissions Inventory Guidance.”<sup>1</sup> This is because EPA’s current guidance on RE studies is focused on broad principles and methods and does not require prescriptive methodologies. As an illustration of this point, EPA states within the current RE guidance that the older guidance upon which MCAQD relied on in crafting the RE study in the 2005 Periodic Inventory can be helpful in calculating emission reductions.<sup>2</sup> EPA also recognizes within the current RE guidance that the development of RE studies is a difficult task due to availability of data and resources by the agency implementing the study. EPA states,**

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<sup>1</sup> 75 FR 54809

<sup>2</sup> Page B-5 of current guidance (“Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,” EPA-454/R-05-001, November 2005) states, “How can I calculate SIP credit for emission reductions achieved via improvements to rule effectiveness? Such credit will need to be determined on a case by case basis. EPA’s older guidance may be used as a point of reference, but pursuant to EPA guidance, “Ozone Nonattainment Planning: Decentralization of Rule Effectiveness Policy; April 27, 1995”, other approaches may be used.”

*“It is unlikely that all state and local agencies will be able to collect sufficient information from all of their stationary sources from which refined RE adjustments can be made. Additionally, no suitable matching studies may exist from which a rule effectiveness value can be obtained. In such situations, the selection of an RE value becomes subjective.”<sup>3</sup>*

In developing the RE study in the 2005 Periodic Inventory MCAQD crafted a study that sought to minimize the inherent subjectivity quoted by EPA above. In many ways, the RE study developed for the 2005 Periodic Inventory is superior to simply looking at a database of inspection records by providing more detailed information than that basic record of inspections can provide. This study employed the use of two inspection personnel at each of the 63 visits, an inspector and a supervising inspector to ensure that the observations regarding violations of the rule by MCAQD staff was quality assured and accurate. This level of quality assurance does not exist when simply looking at a database of inspection records. This also assures that a full level II compliance inspection was done at each study site; this is not the case with the inspection database, as many of the inspections in the database were simply a response to a complaint (partial inspection of site) or even simply a level I inspection that equates to a drive-by visual inspection of the site. Given this reality, it is expected that compliance levels would be higher in the overall database as compared to the intensive inspections done at the 63 sampled sites. Additionally, at the time that the RE study was developed (and even currently), there has been no other agency that has produced an RE study for EPA that focuses on PM-10 from fugitive dust sources beyond a generic assignment of 80% as recommended by the earliest of EPA guidance. These facts show that the RE study developed by MCAQD for the 2005 Periodic Inventory met all available EPA guidance and was the best available estimate of the effectiveness of the rules it evaluated.

**(2) When EPA publicly commented on the 2005 Periodic Inventory, it made no mention of the RE study but only commented briefly on changing the assumptions about the activity level of construction sources (Rule 310).<sup>4</sup>** However, several prominent industry groups including the Arizona Chapter of Associated General Contractors and the Home Builders Association of Central Arizona commented extensively on the RE study. Several of the comments provided by the above mentioned parties even cover in particular detail the discussion of random sample inspections versus the use of available inspection data. MCAQD provided extensive response to these comments, detailing the decisions that went into choosing sample inspections over inspection data in developing the RE study. If EPA had concerns with the RE study during its development, it did not let MCAQD know of them, nor did EPA take the opportunity to agree with the comments in support of using inspection data over sample inspections.

**(3) EPA is relying on hindsight to evaluate the inventory and is ignoring its own legal and procedural history that promotes the use of the best available inventories at the time of plan development. EPA has historically defended such inventories in states' plan submittals, protecting the states from endless delays and costs occurred from adjusting inventories each time new data and methodology appear.** It has been over 3 years since the 2005 Periodic Inventory was made final in May 2007. EPA's

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<sup>3</sup> Page B-2 of “Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,” EPA-454/R-05-001, November 2005

<sup>4</sup> In “Appendix 1, Responsiveness Summary to Comments Received on Public Review Draft 2005 Periodic Emissions Inventory for PM<sub>10</sub> for the Maricopa County, Arizona, Nonattainment Area” of the 2005 Periodic Emissions Inventory for PM<sub>10</sub> for the Maricopa County, Arizona, Nonattainment Area. MCAQD, May 2007

concerns with the RE studies is a recent development and appeared only after MCAQD performed the analysis of a new methodology in early 2010. If MCAQD had not performed the 2010 analysis, there is no indication from EPA that it would have found the methodology in the 2005 Periodic Inventory inaccurate. In actuality, it is commonplace for EPA to approve plans that do not even contain rule effectiveness studies. EPA states in the May 2005 approval of the District of Columbia's VOC rule that,

*"As numerous of EPA's SIP approval Final actions published in the Federal Register amply demonstrate, EPA has approved hundreds of SIP revisions submitted by states consisting of state rules to control VOCs from stationary sources and source categories where such approvals did not require data and modeling to assess the individual rules' impacts on the NAAQS."*<sup>5</sup>

In another case, EPA approved an attainment plan in part on the state's mere promise to conduct a rule effectiveness study after the fact,

*"EPA is proposing to approve the emission reductions that have been projected for the improved leak detection and repair rules. Our approval is based on the improvements to the fugitive rule and Texas' commitment to perform a rule effectiveness study and use improved emission inventory techniques to estimate future emissions to confirm the effectiveness of the program."*<sup>6</sup>

In addition, when states have provided rule effectiveness studies, EPA has defended those states' emission reduction credits. For example, Pennsylvania relied on a rule effectiveness study to demonstrate compliance increasing from 80% to 90%. In response to a commenter's opposition to that study, EPA stated,

*"The EPA disagrees that it is inappropriate to allow credit for improved rule effectiveness (RE) in the attainment demonstration. The Commonwealth has supplied to EPA a protocol that has been implemented at the sources for which increased RE credits have been claimed...No one has brought to EPA's attention credible evidence that Pennsylvania is not implementing RE at the sources for which RE improvement credits are claimed. It would not be appropriate for EPA to discount credit from a state initiative based upon unsubstantiated speculation that such a state will not enforce its own SIP."*<sup>7</sup>

In hindsight, it is understandable the EPA would wish to minimize the role of construction emissions given the recent deep economic recession experienced by the industry. However, during the time the 2005 Periodic Inventory was developed, construction activity was robust and there was no obvious indication that the industry would experience the coming recession. It would be unreservedly unfair of EPA to select an RE methodology based upon present economic realities that were utterly unpredictable at the time of the 2005 Inventory development.

EPA's post-hoc rationalization in the Proposed Rule disapproving the valid inventory methodology in the 2005 Periodic Inventory is contrary to the EPA's long-accepted practice of allowing states to rely on the best available data and methods used at the time of plan submission. EPA routinely rejects comments challenging emissions inventories developed by states when those comments focus on changes in data or methodology. The agency explicitly recognizes that emission inventories may be based on the best

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<sup>5</sup> 70 FR 24963

<sup>6</sup> 70 FR 58131

<sup>7</sup> 66 FR 54160

available data at the time the plan is submitted, rather than requiring extensive changes after the fact. It is commonly understood that emissions inventories are a snapshot in time. They evolve over time as data and new methodologies appear. Indeed, EPA routinely updates or creates entirely new emission models for use in developing emission inventories. As such, EPA has consistently defended the use of the best available inventory at the time of plan development over requiring state and local agencies to update SIP inventories every time a new model appears. In EPA's May 2004 approval of the San Joaquin Valley's Serious Area Plan for PM-10, EPA states the following in response to a comment that the emissions inventory used by San Joaquin Valley contained numerous errors,

*"...EPA recognizes that inventories are not static, but are constantly being updated and renewed as new information, techniques and studies are made available.<sup>16</sup> The State and District used the best available inventories at the time of plan development...EPA generally relied on the State and local agencies to develop, maintain and update their inventories...<sup>16</sup>Once a plan has been adopted, EPA does not generally require plan elements such as emissions inventories to be revisited and updated in response to new information. The U.S. Court of Appeals for the District of Columbia Circuit recently addressed a similar issue and affirmed EPA's position. Sierra Club v. EPA, 356 F.3d 296 (D.C. Cir. 2004)."*<sup>8</sup>

It should be inferred from this quote the EPA feels strongly enough about using the "best available inventories at the time of plan development" to litigate for that position.<sup>9</sup> We agree that this is the position EPA should hold, and it is the position that EPA is ignoring by using hindsight to judge the 2005 Periodic Inventory. Again, it must be stressed that a periodic emissions inventory is a snapshot in time, and should not be disapproved because it did not anticipate the advancements in data, methodologies, or economic realities that would appear in the future. EPA's disapproval of the five percent plan based upon its preference of a new RE methodology over a logical and soundly defended previous one is the definition of a capricious and arbitrary act, especially when it was used to propose disapproval of other parts of the plan.

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<sup>8</sup> 69 FR 30013

<sup>9</sup> The following prevailing opinion from Judge Garland in the court case cited by EPA (Sierra Club v. EPA, 356 F.3d 296 (D.C. Cir. 2004)) highlights EPA's defense of the use of the best available inventory at the time of plan development, "**44 Sierra Club argues that the States should nonetheless have revised the D.C. area ROP plans to incorporate the advances of MOBILE6, for two reasons. First, MOBILE6 was available, albeit for only one month, before the States submitted their plans. Second, EPA did not approve the plans until April 17, 2003, over a year after MOBILE6's release. 45 EPA responds that, although it requires that states use the latest model available at the time a plan is developed, see 42 U.S.C. § 7502(c)(3); 40 C.F.R. § 51.112(a)(1), its policy was not to "require states that have already submitted SIPs or will submit SIPs shortly after MOBILE6's release to revise these SIPs simply because a new motor vehicle emissions model is now available." Conditional Approval, 68 Fed.Reg. at 19,121; see also Memorandum from EPA Office 356 F3d 296 Sierra Club v. Environmental Protection Agency of Air Quality Planning & Standards 2 (Jan. 18, 2002) (J.A. at 530) (same). As the agency explains, "emissions factors, as well as inventory calculation methodologies, are continually being improved."** 68 Fed.Reg. at 19,120. Indeed, as its name suggests, MOBILE5 is the fifth generation of this particular model; MOBILE6 is the sixth. **To require states to revise completed plans every time a new model is announced would lead to significant costs and potentially endless delays in the approval processes. EPA's decision to reject that course, and to accept the use of MOBILE5 in this case, was neither arbitrary nor capricious.**" (emphasis added).

As a result, Arizona's expectation that its valid, thorough emissions inventory would be acceptable to EPA is realistic and comports with the way that EPA has treated other similarly situated states. Because of the state's primary role in developing and implementing plans<sup>10</sup> to achieve the air quality standards, and EPA's lengthy history of approving data that is exactly like or even less than what Arizona submitted, EPA erroneously rejected the emissions inventory and rule effectiveness study in this case.

**EPA Comment, 75 FR 54809:**

*"There is a similar inaccuracy in the rule effectiveness calculations for MCAQD Rule 310.01...an analysis conducted by MCAQD of the entire database of over 4,500 relevant inspections during the time period of the sample inspections yielded an estimated rule effectiveness of 90 percent. See Poppen email."*

**MAG Response:**

EPA incorrectly quotes a value of 90% for a back-casting of rule effectiveness for Rule 310.01 from the Poppen email. An examination of the Poppen email shows that rule effectiveness for Rule 310.01 was back-casted at 77.5 percent, not 90 percent as quoted by EPA. The 90 percent quoted by EPA refers to the compliance rate, not the final rule effectiveness rate.

**EPA Comment, 75 FR 54810:**

*"The inaccuracies in the Baseline emission inventory were carried through into the future year emission inventories and the calculations of emission reductions for those demonstrations."*

**MAG Response:**

Use of the rule effectiveness calculation method preferred by EPA does not interfere with the demonstration of the five percent per year emission reductions required by 189(d). MAG has recalculated the base and future year emissions using the EPA-preferred rule effectiveness calculation method. The rule effectiveness rates for Rules 310, 310.01 and 316 were calculated using the latest inspection data for 2008, 2009, and 2010 (through June 2010) provided by MCAQD. A comparison of the original rule effectiveness rates in the 189(d) plan against rates developed under the EPA-preferred methodology is provided in Table A.

Compared with the Plan, the EPA-preferred method increases the emission reduction percentage in 2008 and 2009 (by 3.5% and 0.4%, respectively) and reduces the percentage by 2.4% in 2010. Note that the MCAQD inspection data only records compliance rates through mid-2010. If rule compliance improves during the last half of 2010, the Plan estimates for 2010 will be higher than 18.0%.

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<sup>10</sup> The Clean Air Act has always provided states with wide latitude in formulating and revising their implementation plans. *National Steel v. Gorsuch*, 700 F.2d 314, 322 (6th Cir. 1983) citing *Ohio Environmental Council v. EPA*, 593 F.2d 24, 29 (6th Cir. 1979). EPA's role is secondary in that process because the states have primary responsibility for developing and implementing the plans to achieve and maintain attainment. *Train v. NRDC*, 421 U.S. 60 (1975). While EPA is not required to accept the state's data without evaluating it, EPA has evolved practices that states should be able to rely on when developing their attainment demonstrations. See, e.g., 700 F.2d at 323; *Latino Issues Forum v. EPA*, 558 F.3d 936, 946 (9th Cir. 2009).

**Table A. Comparison of 189(d) Plan Rule Effectiveness Rates vs. Rates Developed Using EPA-Preferred Methodology**

	Rule Effectiveness Rates in 2007 189(d) Plan				Rule Effectiveness Rates Using EPA-Preferred Method			
	Base	2008	2009	2010	Base	2008	2009	2010
MCAQD Rule 310	51.0%	64.0%	73.0%	80.0%	64.5%	83.0%	86.3%	88.4%
MCAQD Rule 310.01	68.0%	76.0%	76.0%	76.0%	77.5%	77.5%	77.5%	77.5%
MCAQD Rule 316	54.0%	64.0%	72.0%	80.0%	55.9%	49.6%	66.2%	77.6%
PM-10 Emission Reductions* (tons/year)		6,605	15,423	19,840		9,281	14,585	16,277
5% Reduction Targets (tons/year)		4,872	9,744	14,616		4,499	8,998	13,497
Emission Reductions Excess (tons/year)		1,733	5,679	5,224		4,782	5,587	2,780
Base Year (2007) Percentage Reduction		6.8%	15.8%	20.4%		10.3%	16.2%	18.0%

\*Includes all measures quantified in the 189(d) Plan, except contingency measures.

Under either calculation method, the control measures in the Plan reduce total emissions by more than five percent per year through 2010. Since the EPA-preferred method still demonstrates the required five percent PM-10 emission reductions in the 189(d) plan, there is no legitimate basis for disapproving the base or future year emission inventories. This is a technical issue, rather than an approvability one, that EPA should have identified during public review of the 2005 Periodic Inventory or shortly after submittal of the Plan in December 2007. The September 9, 2010 disapproval notice was the first time MAG received any indication that EPA was dissatisfied with the rule effectiveness calculation method. If EPA had identified this issue earlier, MAG could have prepared and submitted a supplement to the Five Percent Plan, Technical Support Document (TSD), demonstrating that the EPA-preferred method would not interfere with the five percent per year demonstration.

**EPA Comment, 75 FR 54810:**

*“Moreover, the underestimation of the effectiveness of Rule 310 and 310.01 resulted in a control strategy with a high probability of failure because the over-emphasis on achieving emission reductions from the sources regulated by these rules likely resulted in a corresponding de-emphasis on emission reductions from other sources contributing to the nonattainment problem in the Maricopa area.”*

**MAG Response:**

EPA’s contention, that there is a high probability of control strategy failure due to over-emphasis on Rule 310 and 310.01 sources, resulting in de-emphasis of other sources, is erroneous. In Table 3 of the FR notice, EPA compares the 2010 emission reductions by source category, concluding that *“the plan’s emphasis on reducing emissions from the construction industry is out of proportion to that source category’s relative contribution to the projected 2010 inventory.”* The Clean Air Act does not require a 189(d) plan (or any other SIP) to contain emission reductions that are proportional to a source’s emissions inventory contribution.

More importantly, EPA’s Table 3 fails to account for the contingency measures in the Five Percent Plan, which are also legally binding commitments that are being implemented. Table B identifies the source distribution of the 25 control measures in the Plan that were quantified for emission reduction credit. It is evident from Table B that the adopted measures in the Plan are targeting all major sources, and most minor sources, of PM-10. It is also important to note that the mix of control measures implemented by the Plan has been successful in eliminating all PM-10 exceedances during stagnant conditions, since the Plan was submitted to EPA in 2007.

**Table B. Source Distribution of 25 Quantified Measures in the 189(d) Plan**

<b>Source Category</b>	<b>Percent of Pre- Controlled 2010 Emissions</b>	<b>Percent of 2010 Emission Reductions</b>
Construction	33.1%	56.5%
Paved Roads (including trackout)	19.1%	15.3%
Unpaved Roads	17.4%	16.6%
Fuel Combustion and Fires	5.6%	0.1%
Windblown Dust from Vacant Land	5.4%	3.7%
Offroad Vehicles	2.4%	0.7%
Agriculture	3.1%	2.0%
Unpaved Parking Areas	3.4%	3.0%
Leaf Blowers	0.9%	0.4%
Industrial Sources	3.9%	1.6%
Other Sources (<5%)	5.7%	0.0%
Total	100.0%	100.0%

Chapter Five of the Five Percent Plan describes the comprehensive control measure evaluation process that was conducted by MAG to ensure that all sources of PM-10 were controlled. The public participation process described in Chapter Nine of the Plan involved key stakeholders, including federal, state, and local government agencies, private industry, and the public. The comprehensive control measure evaluation and public participation processes and the breadth of sources addressed by the adopted measures attest to the fact that no sources were “over-emphasized” or “de-emphasized” in the Five Percent Plan.

**EPA Comment, 75 FR 54814:**

*“EPA has evaluated four of the 2008 exceedances recorded at the West 43<sup>rd</sup> Avenue monitor in south-central Phoenix that the State claims to be due to exceptional events. The exceedances were recorded on March 14, April 30, May 21 and June 4. On May 21, 2010 EPA determined that the events do not meet the requirements of the EER and therefore do not qualify as exceptional events for regulatory purposes.”*

**MAG Response:**

At a meeting with Arizona, Maricopa County, and MAG air quality executives on May 25, 2010, Jared Blumenfeld, EPA Region IX Administrator, stated that the Exceptional Events Rule (EER) is flawed. Staff from EPA OAQPS indicated in an October 1, 2010 videoconference that EPA is working on fixing the flaws. The White Paper in Attachment 1 provides Arizona’s perspective on the major deficiencies with the EER that need to be addressed by EPA. In addition to fixing the flawed rule, MAG requests that EPA reconsider its finding that the four high-wind days in 2008 do not qualify as exceptional events, based on the supplemental documentation ADEQ submitted to EPA in August 2010. This supplemental documentation provides additional compelling evidence that high-wind conditions on March 14, April 30, May 21 and June 4, 2008 meet all criteria of the EER and, therefore, should be reclassified as exceptional events for regulatory purposes. MAG supports and adopts the exceptional events documentation submitted by ADEQ in its comments on this proposed action.

**EPA Comment, 75 FR 54814:**

*“The 189(d) plan provides little or no support for the emission reductions attributed to these increased compliance measures.”*

*"We recognize that calculating accurate emission reduction estimates for increased compliance measures is challenging. It is, however, important for such estimates to have a technical basis, especially when such measures are expected to achieve the majority of the emission reductions in a SIP. One way to begin to address this issue would be to initiate an ongoing process to verify that compliance rates are increasing as expected and that, as a result, the projected emission reductions are actually being realized."*

**MAG Response:**

Since the Plan was submitted in 2007, MCAQD has been collecting the inspection data needed to verify the emission reduction estimates attributed to increases in rule compliance by the Plan. A process to verify compliance rates has been ongoing for many years and the inspection data for 2008, 2009, and 2010 (through June, 2010) reveals that compliance rates are increasing as anticipated in the Plan.

Table A compares rule effectiveness rates calculated for the Plan (based on the 2005 Periodic Emissions Inventory) versus the EPA-preferred method (used in the 2008 Periodic Emissions Inventory). The last row of Table A shows that the percent emission reductions claimed in the Plan for Rules 310, 310.01 and 316 in 2008 and 2009 were conservative, while the reduction for 2010 was slightly over-estimated (by 2.4%). If MCAQD inspection data indicates that rule compliance rates for calendar year 2010 are higher than in mid-2010, the 2010 percentage reduction calculated using the EPA-preferred method will be even closer to the 2010 Plan estimate. This demonstrates that the expected emission reductions in the Plan are being realized and the original Plan estimates were reasonable.

**EPA Comment, 75 FR 54815:**

*"Because the 189(d) plan projects emission reductions surplus to the 5% targets in each year, it is theoretically possible that creditable reductions from the 25 quantified measures would still achieve the 5% reductions when recalculated from an accurate base year inventory. However that could only be determined by an EPA review of a revised plan based on adjusted calculations."*

**MAG Response:**

Table A shows that the base and future year inventories in the Five Percent Plan are similar to the inventories deemed to be more "accurate" by EPA. Therefore, the surplus five percent per year reductions are not needed to achieve the annual reduction targets. Since the substitution of the more "accurate" inventory is a technical issue that has no impact on the five percent demonstration, it is unclear why this issue would provide a basis for disapproval of the Plan. This change should be effected via a supplement to the TSD, rather than a formal SIP revision.

**EPA Comment, 75 FR 54816 and 54817:**

*"For example, Measure #19 is intended to reduce off-road vehicle use in areas with high off-road vehicle activity. For this measure, the 189(d) plan assigns emission reduction credit to the requirement in ARS 9-500.27. A, as submitted in the 189(d) plan, that cities and towns in the Maricopa area adopt, implement and enforce ordinances no later than March 31, 2008, prohibiting the use of such vehicles on unpaved surfaces closed by the landowner."*

*"However, because the 189(d) plan was submitted at the end of 2007, the contingency measures, i.e., the vehicle use prohibition, could not be fully implemented throughout the Maricopa area without additional future legislative action on the part of a number of governmental entities."*

*"This is the case with Measure #19, mentioned above. For that measure, the 189(d) plan claims emission reduction credit assuming that all jurisdictions subject to the 2008 statutory requirement will comply."*

**MAG Response:**

To ensure that the legally-binding measures, including contingency measures, are being implemented, MAG prepares annual reports that track the status of the 53 measures in the Five Percent Plan. The first such tracking report is the "2008 Implementation Status of Committed Measures in the MAG 2007 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area", published in January 2010. The 2008 tracking report identifies the actions that were taken to implement Measure #19, "Reduce off-road vehicle use in areas with high off-road vehicle activity," in 2008. Attachment 2 shows that this contingency measure was fully implemented in 2008 *throughout the nonattainment area, with no additional future legislative action required by any other governmental entity.*

EPA's comment fails to recognize that the contingency measures are legally-binding commitments that are being implemented early so that the standard can be achieved as expeditiously as practicable. In the Plan, emission reduction credit for this contingency measure was reduced by one-third in 2008 to reflect the March 31, 2008 implementation date identified in SB 1552. The 2008 tracking report shows that Measure #19 was implemented according to the schedule shown in the Plan and therefore, the emission reductions claimed for this contingency measure in the Five Percent Plan were appropriate.

**EPA Comment, 75 FR 54817:**

*"Furthermore, not only do some of the contingency measure commitments fail to meet the requirement of section 172(c)(9) that such measures are to be implemented with minimal further action, but because they depend on future actions that may or may not occur, it is also impossible to accurately quantify emission reductions from them at the time of plan development and adoption."*

**MAG Response:**

None of the contingency measures in the Five Percent Plan requires further legislative action. According to the 2008 tracking report, eight of the nine measures are being implemented according to the legally-binding commitments and schedules included in Chapter Six of the Five Percent Plan. Only contingency Measure #5 has not been implemented by ADEQ because of budgetary constraints.

The EPA comment implies that it is not possible to accurately quantify emission reductions for future measures that may or may not occur. Following this logic, if the contingency measures were to be triggered by failure to achieve attainment or RFP (rather than early implementation), it would be impossible to meet the one year of RFP emission reduction requirement, because the measures would *depend on future actions that may or may not occur.* With the exception of Measure #5, the contingency measures in the Five Percent Plan were implemented in 2008 and the benefits were conservatively estimated, as supported by the quantification of actual emission reductions in the 2008 tracking report.

**EPA Comment, 75 FR 54817:**

*"Another example of this quantification issue is Measure #26 regarding the paving or stabilization of existing public dirt road and alleys...This measure includes commitments in*

*resolutions adopted by 11 cities and towns to pave roads from 2007 through 2010 and claims emission reduction credit assuming full compliance.”*

**MAG Response:**

Under contingency Measure #26, eleven cities and towns made legally-binding commitments to pave or stabilize dirt roads and alleys. Credit for these measures was apportioned to the years 2007-2010 based on the schedules contained in the commitments. The 2008 tracking report indicates that there were 15 more miles of dirt roads and 21 more miles of dirt alleys paved than indicated in the 2008 commitments. In addition, there were three less miles of dirt roads and 70 more miles of dirt alleys that were stabilized than in the 2008 commitments. Overall, the credit assumed for Measure #26 in the Five Percent Plan is far less than the actual emission reductions that occurred due to paving and stabilizing dirt roads and alleys in 2008.

**EPA Comment, 75 FR 54817:**

*“See also Measure #5 which quantifies as a contingency measure a requirement in ARS 49-457.02 that ADEQ establish a dust-free development program by September 19, 2007...However, a 2010 report prepared by MAG addressing the 2008 implementation status of the 53 measures in the 189(d) plan states that this measure was not implemented because ADEQ delayed the certification program indefinitely due to budgetary constraints.”*

*“See also Measure #24 which includes among others, a commitment by the Arizona Department of Transportation (ADOT) to require in the contract awarded in January 2008 that contractors use PM-10 certified street sweepers on all State highways in the Maricopa Area...The 2008, 2009, and 2010 emission reductions claimed for Measure #24 assume implementation of the ADOT component of the measure, However, the 2008 Status Report states that “ADOT’s current contract...does not require the use of PM-10 certified street sweepers...”*

**MAG Response:**

The Five Percent Plan assigns emission reductions of 28.9 tons/year in 2008, 21.5 tons/year in 2009, and 17.6 tons/year in 2010 to Measure #5. The renegotiated ADOT contract requiring use of PM-10 certified sweepers became effective on February 20, 2010. The ADOT contract portion of Measure #24 was assigned emission reductions of 10.37 tons/year in 2008 and 11.31 tons/year in 2009 in the Plan. The benefits attributed to these two contingency measures were small and their elimination does not interfere with meeting the one-year of RFP emission reduction target of 4,869 tons/year. As shown in these two examples, the emission reductions for contingency measures in the Plan were conservatively estimated. In addition, the total benefits of the contingency measures in the Plan exceed the one-year of RFP target by 354 tons/year in 2008, 2,344 tons/year in 2009, and 4,290 tons/year in 2010. These excesses provide a safety margin that allows for delays in implementation, such as those experienced by ADEQ and ADOT, without compromising attainment of the one year of RFP target in 2008-2010.

**EPA Comment, 75 FR 54817:**

*“The 189(d) plan provides no methodology or support for the PM-10 emission reductions credited to a number of the contingency measures. For example, the group of Measures #14, #15 and #17 designated in the plan as “multiple” is intended to reduce trackout onto paved roads...The 189(d) plan...states that the reduction in trackout emissions in the PM-10 nonattainment area is expected to be at least 15 percent in 2008-2010...No information is provided in the 189(d) plan regarding how the 15 percent was determined. Furthermore, the*

*reductions from each measure are not disaggregated so it is impossible to determine the source of the claimed emission reductions or how they were calculated for each measure.”*

**MAG Response:**

MAG conducts local data collection studies (e.g., the Silt Loading Study in 2006, the PM-10 Source Attribution and Deposition Study by Sierra Research and T&B Systems in 2006-2007; and the Unpaved Road Inventory in 2007-2009) that are useful in quantifying and verifying the technical assumptions in PM-10 plans. The annual MAG tracking report also provides data with which to verify the accuracy of the emission reductions for the 25 measures that were quantified in the Five Percent Plan.

For example, in the description of Measure #28, the Five Percent Plan TSD states: *“The emission factors for paved roads with high silt loadings due to trackout and dragout from dirt shoulders and other sources of fugitive dust were derived from the MAG Silt Loading Study conducted by the College of Engineering, Center for Environmental Research and Technology, University of California, Riverside (CE-CERT). CE-CERT used state-of-the-art mobile technologies to measure PM-10 concentrations and derived PM-10 emission rates for paved roads. The SCAMPER (System for Continuous Aerosol Monitoring of Particulate Emissions from Roadways) vehicle collected data on a 104-mile route that was designed to be representative of typical paved road types and sources of fugitive dust in the PM-10 nonattainment area. The SCAMPER vehicle was driven over the entire route during a five-hour period (9:30 a.m. to 2:30 p.m.) on 13 weekdays and five weekend days in March, June, September and December of 2006.”*

The description of the trackout reduction Measures #14, #15, and #17 in the Five Percent Plan TSD indicates that the SCAMPER data was used to determine average PM-10 emission rates for paved roads with high trackout levels. These high trackout emissions were reduced by Measure #28, Paving and Stabilizing Unpaved Shoulders, before applying the 15 percent reduction that represents the benefits of contingency Measures #14, #15 and #17. Although allocation of the 15 percent benefit among the three measures is not explicitly documented in the Plan, Measure #14, Reduce dragout and trackout emissions from nonpermitted sources, for which Maricopa County adopted Rule 310.01 revisions in March 2008, would contribute most of the 15 percent reduction. Unfortunately, there was no empirical data to assist in quantifying the future benefits of a measure that has not been implemented in the Maricopa area or elsewhere. In these cases, MAG relies on the significant experience that its staff and consultants have in quantifying the benefits of measures for other PM-10 plans. The 15 percent reduction in trackout emissions attributed to Measures #14, #15 and #17 is still considered to be an appropriate and conservative estimate.

It is also important to note that all emission reduction assumptions in the Five Percent Plan were reviewed by the MAG Air Quality Planning Team and the MAG Air Quality Technical Advisory Committee (both of which include EPA representatives) prior to Plan submittal and MAG received no comments on or opposition to the 15 percent reduction assumption at that time. It is difficult to fathom that any PM-10 nonattainment area would have more expertise and locally-collected data available to develop the technical assumptions in the Five Percent Plan, than the Maricopa County area.

**EPA Comment, 75 FR 54817:**

*“Similarly, for Measure #1, the plan identifies annual emission reductions from seven source categories resulting from public education and outreach in various local jurisdictions but does not explain how these reductions were calculated...See also Measure #5 which provides annual emission reduction credits without any supporting information.”*

**MAG Response:**

Pages IV-1 and IV-2 in the TSD for the Five Percent Plan describe how the emission reduction of 0.1 percent was applied to Measures #1 and #5. For Measure #1, this 0.1 percent reduction was applied to each of the seven source categories that would be positively impacted by public education and outreach programs conducted throughout the PM-10 nonattainment area. The total impact of Measure #1 is minor, ranging from 48 tons/year in 2008 and 2009, to 49 tons/year in 2010.

For Measure #5, the 0.1 percent reduction was applied to each of the seven construction source categories. Once again, the total benefit of this measure is minor, ranging from 29 tons/year in 2008, to 22 tons/year in 2009, to 18 tons/year in 2010.

As shown in these two examples (and responses to previous comments on emission reductions for contingency measures), the benefit for these measures was conservatively estimated. The total benefits of the contingency measures in the Plan exceed the one-year of RFP target by 354 tons/year in 2008, 2,344 tons/year in 2009, and 4,290 tons/year in 2010. The conservative estimates of benefits, along with the excess benefit safety margin, result in a set of contingency measures that reduce at least one-year of RFP in 2008-2010, as reported in the Five Percent Plan.

**EPA Comment, 75 FR 54818:**

*“Given the overemphasis in the plan on reducing emissions from construction activities, it is quite possible that more reductions in onroad emissions will be required to meet the applicable requirements.”*

**MAG Response:**

EPA contends that the Five Percent Plan over-emphasizes controls on construction activities and de-emphasizes controls on other sources that are contributing to nonattainment of the PM-10 standard. These comments ignore the success of the Five Percent Plan measures in eliminating stagnation-based exceedances in 2008 through 2010.

PM-10 monitors in the Maricopa County nonattainment area recorded 30 exceedances of the 24-hour standard in both 2005 and 2006. Most of those exceedances occurred during the fall and winter under low wind and severe inversion conditions. Recognizing the difficulty of demonstrating attainment under these conditions, MAG undertook an extensive field study to quantify source contributions under low wind conditions in the Salt River area<sup>11</sup>. EPA staff commented on the analysis and interpretation of data collected in the study. EPA staff also commented on subsequent efforts to identify and quantify the benefits of control measures focused on sources addressed in the field study. EPA staff also commented on the development of the modeling protocol employed in the Five Percent Plan and was well aware that the focus of the Plan was to identify a mixture of controls that would bring the area into attainment under the conditions of most concern – stagnation conditions. To this end, the Five Percent Plan has been successful, as exceedances of the PM-10 standard under stagnation conditions have disappeared since the adoption of the Plan.

While the Five Percent Plan addressed both stagnant and high wind conditions, the mix of wind related control measures was limited. Representation of high wind emissions in the Periodic Emissions Inventory was small (roughly 6%), since their occurrence was infrequent. AERMOD was used in the Five Percent Plan to model stagnant (December 11-13, 2005) and high wind (February 15, 2006) design day

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<sup>11</sup> PM-10 Source Attribution and Deposition Study, conducted by Sierra Research for the Maricopa Association of Governments, February 2008

conditions and the mix of adopted controls was sufficient to demonstrate attainment. Given this perspective, MAG finds EPA comments on the adequacy of the selected control measures to be inappropriate and inconsistent.

The mix of controls adopted to eliminate stagnation-driven exceedances was appropriate. The Five Percent Plan did not emphasize controlling emissions under elevated wind conditions because (1) their occurrence was less frequent and (2) exceptional event submissions for high wind days were rarely subject to dispute. Changing the mix of selected controls to proportionately address the source representation in the Five Percent Plan emissions inventory will do little to reduce the emissions under high wind conditions. Similarly, increased reductions in onroad emissions will do little to reduce emissions under high wind conditions.

**ATTACHMENT 1**

**ARIZONA'S RECOMMENDED CLARIFICATIONS TO THE EXCEPTIONAL EVENTS RULE**

## **ARIZONA'S RECOMMENDED CLARIFICATIONS TO THE EXCEPTIONAL EVENTS RULE**

Representatives of the State of Arizona participated in the September 2, 2010 EPA call with other state and local governments to discuss what the agency characterized as "Ideas for Improvement" as far as the implementation of the Exceptional Events Rule (72. Fed. Reg. 13560; March 22, 2007) (the "EER"). As a member of WESTAR, Arizona strongly supports the September 11, 2009 recommendations from WESTAR, as well as those from the California Air Resources Board as to how the implementation of the EER might be improved. In addition, based upon our extensive experience in attempting to understand and comply with the requirements of the EER, we would recommend that EPA act to clarify the EER in three critical respects.<sup>1</sup>

### **1. Process**

Neither Section 319 of the Clean Air Act ("CAA") nor the EER sets forth a procedure for a State to follow when it submits "appropriate documentation" for an exceptional event demonstration or the procedure to be followed by EPA when it considers that documentation. Apparently a specific procedure was felt to be unnecessary in the rules because the documentation package would only be submitted after extensive "collaboration" and "consultation" had occurred between the State and EPA. In the preamble to the EER, the critical role played by consultation and collaboration in the consideration of exceptional events documentation is mentioned on five occasions. Indeed, in response to a comment that EPA establish an appellate process when regional EPA offices fail to concur with a demonstration, EPA responded that such a process was unnecessary "because we anticipate that the States and Regional Offices will be working closely through the data and documentation submission process." 72 Fed. Reg. at 13574. It is the State's experience that if the consideration of exceptional events demonstration is to produce a predictable and consistent result, there must be a more formalized, structured and streamlined procedure for consideration of exceptional events by the regional offices and the procedure must explicitly require EPA to engage in consultation and collaboration with the States at every stage prior to submission. Also, the procedure must require that there be an administrative record upon which the regional offices must rely and because the EER requires that a weight of evidence approach be applied, the record must contain the totality of the information on which the determination is based and EPA must specify the elements of the record on which its decision was based.<sup>2</sup>

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<sup>1</sup> All of our recommendations are based on either the language of Clean Air Act Section 319, the EER and its Preamble or implementation of the EER from EPA determinations in the Federal Register.

<sup>2</sup> As prescribed by the EER and its preamble, the State believes that the following are the steps in the exceptional event decision process:

**Prior to Submission:**  
Exceptional Event Identification  
Exceptional Event Documentation Development  
Public Comment

2. **The Information Necessary to Demonstrate that Anthropogenic Sources are “Reasonably Well-Controlled” at the Time that the Event Occurred.**

The level and nature of the documentation necessary to demonstrate that anthropogenic sources are reasonably well-controlled as required by CAA section 319(b)(1)(A)(ii) and the EER at 40 C.F.R. § 50.1(j), must be specifically set forth in guidance. From EPA’s determinations on past exceptional events demonstrations, there are several principles that the State believes should be incorporated in guidance:

- In keeping with the predecessor to the EER, EPA’s Natural Events Policy, that was relied upon by Congress when CAA section 319 was amended, if a State has what EPA has determined are Best Available Control Measures in place and the means and commitment to enforce them, it should be presumed that the anthropogenic activities to which the measures applied are reasonably controlled;
- Exceptions to this presumption exist if there were unusual emissions as far as nature or extent linked to anthropogenic activities that were observed during that period.<sup>3</sup>

The guidance should also stress that States making the demonstration should not have to show that sources upwind of an affected monitor were “actually controlled,” since such a showing, particularly in an urban environment, is a “practical impossibility.” Id. 73 Fed. Reg. at 14692.

3. **Demonstrating the Clear Causal Relationship Between the Measurement Under Consideration and the Event Claimed to have Affected the Air Quality in the Area.**

The guidance should state that the clear causal relationship demonstration required by CAA section 319 need only be shown for the “particular air quality monitoring location” at which the measurement occurred. This is what is explicitly required in both CAA section 319(b)(3)(B)(ii) and the EER at 40 C.F.R. § 50.14(c)(3)(iii)(A). Thus, while information about the temporal and spatial extent of an event is relevant to the demonstration of causality (see 72 Fed. Reg. at 13573) and may

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**Post Submission:**  
Completeness Determination  
State Responses Correcting Deficiencies  
EPA Exceptional Event Documentation Development  
Public Comment Prior to Decision

<sup>3</sup> See generally the analysis of these principles in EPA’s approval of the San Joaquin Valley PM-10 nonattainment area exceptional events demonstration at 73 Fed. Reg. 14687 at 14687, 14691 and 14693 (March 19, 2008).

help determine the overall magnitude of the event, the clear causal relationship criterion need only be demonstrated for the monitor(s) that actually were affected by the event.

**ATTACHMENT 2**

**2008 STATUS OF COMMITTED MEASURE #19 IN THE MAG FIVE PERCENT PLAN FOR PM-10:  
"REDUCE OFF-ROAD VEHICLE USE IN AREAS WITH HIGH OFF-ROAD VEHICLE ACTIVITY"**

**2008 Status of Committed Measure #19 in the MAG 2007 Five Percent Plan for PM-10  
"Reduce off-road vehicle use in areas with high off-road vehicle activity"**

Ordinance to prohibit off-road vehicle use required by SB 1552. (A.R.S. § 9-500.27 A.- E. and A.R.S. § 49-457.03)

In February 2008, Maricopa County adopted the P-28 Off-Road Vehicle Use in Unincorporated Areas of Maricopa County Ordinance. This ordinance was developed to address dust concerns raised by vehicle use and trespass on private and public property. It is intended to complement Maricopa County Rule 310.01, which focuses on property owners' responsibility to maintain soil stabilization.

Currently, the Maricopa County Ordinance P-28 is undergoing revisions to its penalty structure, which is intended to provide more flexibility in adjudicating cases. Until these revisions are approved, the County is developing information on frequent complaint areas and access points, enforcement history, ongoing outreach efforts by police departments, Justice Court procedures, and database needs. In addition to responding to complainants' concerns, MCAQD has organized a group of inspectors to gather this type of information and begin making direct contacts in the field. In 2009, MCAQD initiated efforts to develop a partnership with law enforcement agencies, not only to address the inspectors' limited authority on these contacts, but also to provide a consistent enforcement message to the public.

23 local governments have new or existing ordinances to prevent or discourage off-road vehicle use and restrict access to areas with high off-road vehicle use.

ADEQ distributed 3,700 hard copies of "Nature Rules" map to off-road highway vehicle (OHV) dealers and posted materials on the Arizona State Parks website (website received 11,660 visits), ADEQ's website (website received 2,741 visits), and the Arizona Game and Fish Department website.

Maricopa County, 17 local governments, and ADEQ, have conducted public education and outreach to discourage off-road vehicle use in the PM-10 nonattainment area. The Tonto National Forest included a segment on dust control education in its off-highway vehicle (OHV) training program.

8 jurisdictions with high off-road activity have restricted vehicle use by installing signs and/or physical barriers.

One local government stabilized 57 acres with hydroseed and posted "No Trespassing" signs on 4.1 miles of vacant areas in two washes.

Arizona State Trust Land spent \$159,203 to implement the following control measures: installation of 1,037 linear feet of concrete barriers; installation of 7,352 linear feet of chain link fence; purchase of 300 "No Trespassing" signs; purchase and installation of two 10-foot gates; posting of 38 "Area Closed by Commissioners Orders" signs; posting of 2 "Closed for Soil Stabilization" signs; posting of 14 "No Trespassing" signs; and increasing the presence of law enforcement.

Arizona State Parks installed one kiosk and two access gates; replaced 1 mile of fencing; provided outreach at 77 official events; and provided 3,100 public information contacts. Arizona Game and Fish Department issued 27 citations for violations of the OHV law.



October 20, 2010

**VIA U.S. MAIL AND ELECTRONIC MAIL**

Ms. Lisa Jackson  
Administrator  
U.S. Environmental Protection Agency  
EPA Docket Center, Mailcode 2822T  
1200 Pennsylvania Ave, NW  
Washington, DC 20460-0001

Re : Comments on Docket ID No. EPA-R09-OAR-2010-0715: Proposed Partial Approval  
Partial Disapproval of the Maricopa Area 5% Plan

Dear Administrator Jackson:

The Arizona Department of Environmental Quality (ADEQ), Maricopa Association of Governments (MAG) and the Maricopa County Air Quality Department (MCAQD) provide the following comments on the proposed partial approval and partial disapproval of the Maricopa Area 5% Plan in Docket ID No. EPA-R09-OAR-2010-0715. This proposed action would partially approve portions of the "MAG 2007 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area" (the 5% Plan) developed by the Maricopa Association of Governments in 2007, and submitted by the State of Arizona to EPA as a revision to the State Implementation Plan (SIP) for the Maricopa County serious PM-10 non-attainment area.

ADEQ, MAG and MCAQD each play a significant, yet independent role in addressing air pollution issues within the Maricopa County serious PM-10 nonattainment area. EPA's proposed partial approval and partial disapproval of the 5% Plan offers little recognition of the strong efforts that have been made to combat air pollution within the area. Arizona's collective efforts and the implementation of the 5% Plan have resulted in significant air quality improvements. Using the annual average concentration at five monitoring stations within the Phoenix area<sup>1</sup>, concentrations of PM-10 between 1990 and 2009 have declined 10 micrograms per cubic meter, or the equivalent of 24%. Using the annual average concentration at eleven monitoring stations within the Phoenix area<sup>2</sup>, ADEQ has observed similar improvements as concentrations of PM-10 between 2000 and 2009 have declined 15 micrograms per cubic meter, or the equivalent of 25% (see Attachment 1). According to data compiled by MAG, out of a possible 6,222 total daily monitor readings (17 monitors x 366 days) during 2008, there were

<sup>1</sup> The West Phoenix, Mesa, North Phoenix, Glendale and South Scottsdale monitors

<sup>2</sup> The West Phoenix, Mesa, North Phoenix, Glendale, Central Phoenix, South Scottsdale, Greenwood, South Phoenix, West Chandler, Higley and Durango Complex monitors.

only 11 exceedances. In other words, the monitors showed that the Phoenix area had clean air 99.82% of the time. Looking at only the West 43<sup>rd</sup> Avenue monitor, the results are similar. Of the 366 monitoring days in 2008 only five, or 1.4%, of the days exceeded the standard at that monitor. Furthermore, the majority of these exceedances have been documented by ADEQ and MAG to be exceptional events.

Cleaner air has been achieved at the same time the Phoenix metropolitan area has experienced unprecedented growth. In 1990, Maricopa County was home to approximately 2.1 million residents. By 2000, the County's population had grown to 3 million. By 2009, census estimates place the population of Maricopa County at 4.1 million people<sup>3</sup>. As population within the County has increased 100% since 1990, the annual average concentration of PM-10 air pollution within the County has decreased by 24%. If EPA were to concur with the State's documentation of exceptional events in 2008, the Maricopa County serious PM-10 nonattainment area would likely have three years of data demonstrating that the area had come back into compliance with EPA's national air quality standard. While there is always an opportunity to improve in some way to reduce pollution and protect public health, there must also be a recognition that some sources of air pollution are naturally occurring and can not be controlled.

#### **MEASURES PROPOSED FOR FULL APPROVAL**

ADEQ, MAG and MCAQD support EPA's approval of the twenty measures listed by EPA in Table 4 of the proposed action on the 5% Plan. We appreciate EPA's acknowledgment of the strength of these measures in controlling PM-10 in the Maricopa County region.

#### **EXCEPTIONAL EVENT DEMONSTRATIONS**

EPA's proposed action is partially based upon a May 21, 2010 determination by Region IX Administrator Jared Blumenfeld to not concur with four exceptional event demonstrations provided by ADEQ for March 14, April 30, May 21, and June 4, 2008. As noted in numerous letters to Regional Administrator Blumenfeld, letters to Administrator Jackson, and comments on EPA's proposed consent decree that set the schedule for EPA's actions on the 5% Plan, ADEQ, MAG and MCAQD maintain that the process EPA used, and conclusion reached, were both in error. Had EPA followed the guidance set forth in the preamble for the Exceptional Events Rule (40 CFR § 50.14), EPA would have consulted and collaborated with Arizona prior to making a determination. This consultation and collaboration would have resulted in the development of additional information that would have resolved the concerns that EPA expressed in its May 21, 2010 non-concurrence. Instead, ADEQ and MAG were left to submit many volumes of information regarding these four dates, reaffirming the State's position that exceedances at the West 43<sup>rd</sup> Avenue monitor in Phoenix truly were the result of exceptional events that could not be reasonably controlled. A list of all of the documents that have been submitted, or are considered to be instructive on this matter, are identified in Attachment 2.

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<sup>3</sup> <http://quickfacts.census.gov/qfd/>

Although EPA provided responses to the cover letters that submitted additional documentation, ADEQ and MAG continue to await EPA's response to the technical details enclosed in these letters. As a result, ADEQ, MAG and MCAQD incorporate each of the documents identified in Attachment 2 as comments on EPA's proposed action and request consideration of the information prior to the disapproval of the 5% Plan.

EPA has publicly acknowledged that improvements can be made to the Exceptional Events Rule (EER) and/or its implementation. This is important because EPA used the EER to disagree with ADEQ and MAG's findings and conclude Maricopa County continues to be in non-attainment. The circular reasoning encouraged and condoned by the existing EER leads to absurd results with significant consequences. While it is unlikely that EPA will promulgate a policy memo or guidance on the EER prior to a final action on the 5% Plan, there are two specific principles that ADEQ, MAG and MCAQD ask EPA to consider when reviewing the additional documentation that is being submitted in these comments:

1. Reasonableness of Controls

The Maricopa County area has been classified as a serious non-attainment area for many years. All of the sources that have been determined to be significantly contributing to the non-attainment area have been the subject of BACM and Most Stringent Measures (MSM) for many years. In an urban environment such as the greater Phoenix metropolitan area, it is virtually impossible to verify the compliance status of every operation that emits PM-10. ADEQ, MAG and MCAQD contend that implementation of the control program throughout the Maricopa County should bear significant weight when determining whether reasonable controls have been applied.

In addition, evidence that Notices of Violation (NOVs) were issued on the day of an exceptional event should not be evidence that BACM and MSM were not in place. When considering the value of these NOVs, EPA should consider the total number of inspections that were done and the relative impact emissions associated with the NOV would have on the monitoring area. In general, ADEQ, MAG and MCAQD consider NOVs to be evidence of a properly functioning control program, and not direct evidence to the contrary.

2. Clear Causal Relationship

The EER has established that every exceptional event demonstration must be reviewed on a case-by-case basis. Section 319(b)(3)(B)(ii) and 40 CFR 50.14(c)(iii)(A) explicitly require that the clear causal relationship be demonstrated for the "particular air quality monitoring location" at which the measurement occurred. As a result, while it might be interesting to note the overall magnitude of an event by documenting the number of other monitors that show exceedances at the same time, this should not be the only criteria used to

judge whether an exceedance at a single monitor is exceptional. It is ADEQ, MAG and MCAQD's experience that a single monitor can experience an exceptional event due to the circumstances that exist at that monitor.

## **EFFECT ON ECONOMY**

If EPA finalizes the disapproval of the Plan, a conformity "freeze" will result within 30 to 90 days after the effective date of the disapproval. A conformity freeze would mean that only those projects that are scheduled to occur in the first four years of the most recent conforming Regional Transportation Plan ("RTP") and Transportation Implementation Plan ("TIP") can proceed and no new or amended RTPs or TIPs can be found to conform to the SIP until the new SIP is approved by EPA. Given the dynamic nature of the transportation planning process for the Maricopa area, the impact of a long-term conformity freeze would be devastating on the economy. MAG processes amendments to the TIP frequently, often on a monthly basis. It is crucial that this process remain fluid, especially in this economic downturn as unexpected changes to the TIP have been forced due to declining revenues. In addition, the region would not be able to take advantage of stimulus dollars for new major projects during a conformity freeze.

Few counties, if any, in the country have been as devastated by this recession as Maricopa County. A disapproval of the 5% Plan would further substantially damage our economic situation with significant negative impacts on individual families and communities. Foreclosure rates in the Phoenix metro area are at an all-time high, with nearly 60,000 distressed properties either already foreclosed or pending foreclosure. Almost 100,000 construction jobs have been lost in the region over the last three years.

## **CONCLUSION**

EPA's proposed partial disapproval of the 5% Plan is inappropriate when considering the timing of EPA's decision and actual number of exceedances within Maricopa County. All non-attainment area plans are precisely that - plans. Plans are developed using the best available information about the conditions that exist at the time of development. This information is then projected into the future utilizing the best assumptions about what is likely to occur in the future. Under normal circumstances, EPA's final action on any plan already benefits from 18 months of information that was unavailable at the time of the plan's development and submission. In the case of the 5% Plan, EPA did not act before its non-discretionary deadline of June 30, 2009. As a result, EPA benefitted from the hindsight of yet another 18 months (for a total of three years from 2008 to 2010). ADEQ, MAG and MCAQ, on the other hand, could only guess what would happen in 2008, 2009, and 2010 when the plan was submitted in 2007.

At the same time, EPA has added uncertainty to the planning process by making use of tools such as the Exceptional Events Rule confusing and impractical. Instead of acknowledging that a serious PM-10 non-attainment area plan calls for the implementation of BACM throughout the non-attainment area, EPA proposes to use an exceedance from an exceptional event as a demonstration that the sources within the non-attainment area are not reasonably controlled.

Ms. Lisa Jackson  
U.S. Environmental Protection Agency  
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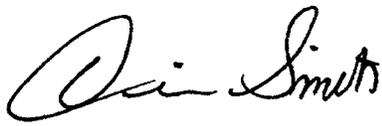
EPA then appears to reason that the plan does not adequately apply BACM, ensuring that the event can never be considered exceptional. Such circular reasoning can only lead to a cycle of submission and disapproval of plans, forcing Arizona to expend limited resources on issues and problems that are beyond its reasonable control.

There are always opportunities to improve air quality, and ADEQ, MAG and MCAQD are committed to making improvements to the 5% Plan. At the same time, ADEQ, MAG and MCAQD encourage EPA to consider the heavy impacts of its decision in this matter, especially given these already difficult economic times. We understand that EPA has some discretion about the date upon which some of the sanctions may occur. Consequently, ADEQ, MAG and MCAQD ask that EPA exercise its discretion and ensure that any conformity "freeze" that might occur begin at least 90 days after the effective date of the final action.

Thank you for your attention.

Sincerely,

  
Benjamin H. Grumbles, Director  
Arizona Department of Environmental Quality

  
Dennis Smith, Executive Director  
Maricopa Association of Governments

  
William Wiley, Director  
Maricopa County Air Quality Department

Cc: Gregory Nudd, EPA

Attachments (2):

1. PM10 Trends in Phoenix Metro
2. List of Documents

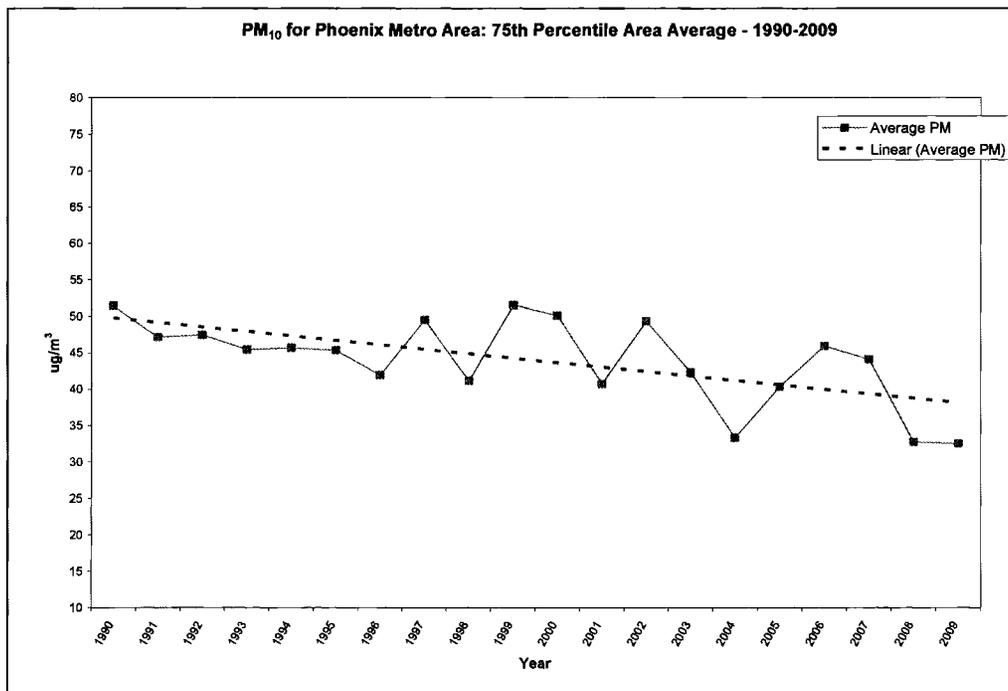
## PM<sub>10</sub> Trends in Phoenix Metro

1990 – 2009

For the twenty year period from 1990 to 2009, five sites were used to assess PM<sub>10</sub> trends in the Phoenix Metropolitan area. The five sites include West Phoenix, Mesa, North Phoenix, Glendale, and South Scottsdale.

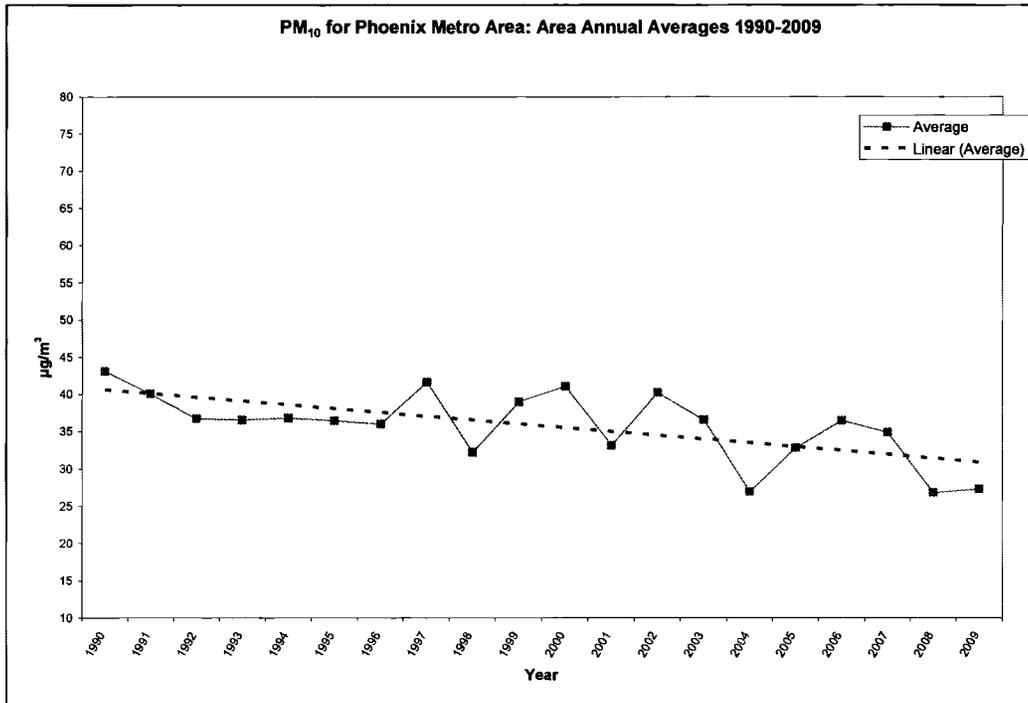
*Using the 75<sup>th</sup> Percentile as the indicator:*

1990 – 2009 → Over the last 20 years, there has been a 12 μg/m<sup>3</sup> decrease in PM<sub>10</sub> concentrations within the Phoenix Metro area (5 sites were used). This equates to a 24% decrease in PM<sub>10</sub> concentrations over the 20 year period.



*Using the Annual Average as the indicator:*

1990 – 2009 → Over the last 20 years, there has been a 10 μg/m<sup>3</sup> decrease in PM<sub>10</sub> concentrations within the Phoenix Metro area (5 sites were used). This equates to a 24% decrease in PM<sub>10</sub> concentrations over the 20 year period.

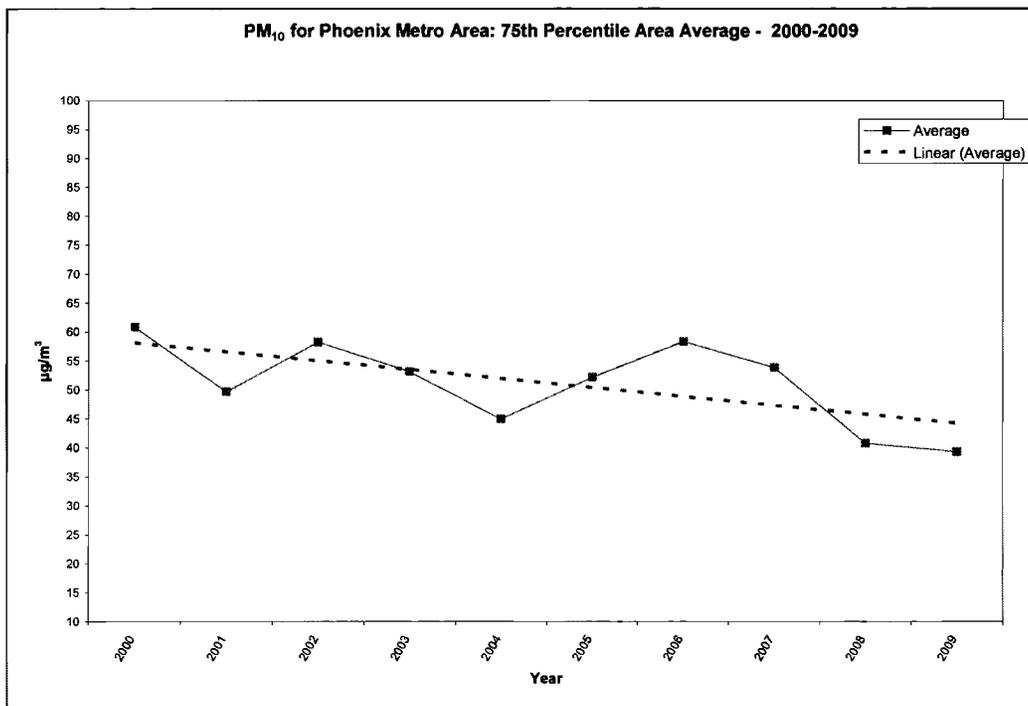


## 2000 – 2009

For the ten year period from 2000 to 2009, eleven sites were used to assess PM<sub>10</sub> trends in the Phoenix Metropolitan area. The eleven sites include West Phoenix, Mesa, North Phoenix, Glendale, Central Phoenix, South Scottsdale, Greenwood, South Phoenix, west Chandler, Higley, and the Durango Complex.

*Using the 75<sup>th</sup> Percentile as the indicator:*

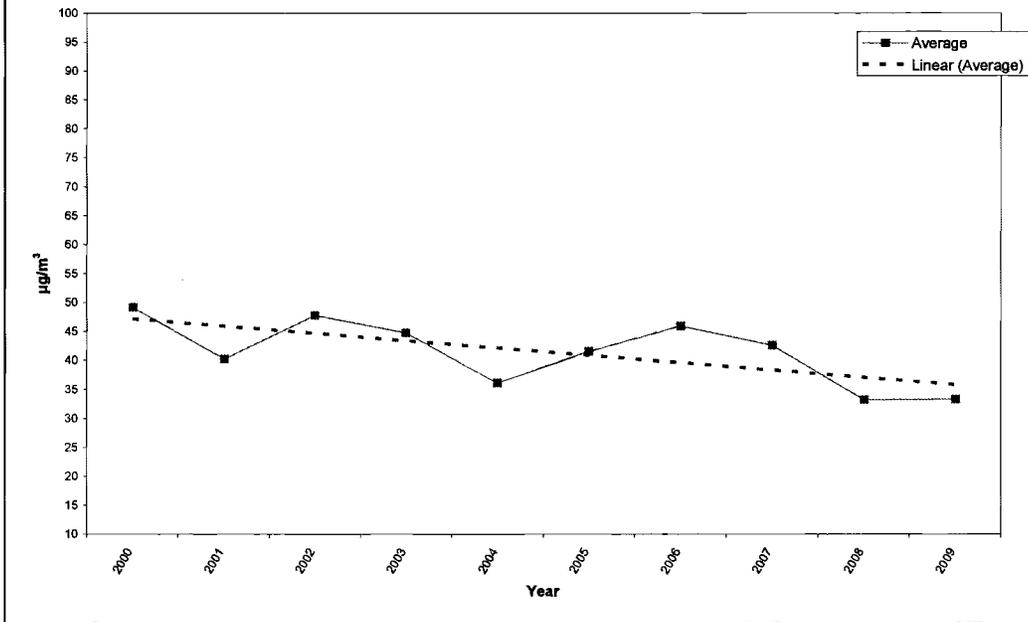
2000 – 2009 → over the last 10 years, there has been a 15 µg/m<sup>3</sup> decrease in PM<sub>10</sub> concentrations within the Phoenix Metro area (11 sites were used). This equates to a 25% decrease in PM<sub>10</sub> concentrations over the 10 year period.



*Using the Annual Average as the indicator:*

2000 – 2009 → over the last 10 years, there has been a 12 µg/m<sup>3</sup> decrease in PM<sub>10</sub> concentrations within the Phoenix Metro area (11 sites were used). This equates to a 25% decrease in PM<sub>10</sub> concentrations over the 10 year period.

PM<sub>10</sub> for Phoenix Metro: Area Annual Averages 2000-2009



## LIST OF DOCUMENTS

DATE	TITLE
09/16/08	Letter to Deborah Jordan, EPA, from Nancy Wrona, ADEQ, regarding submittal of Final Demonstrations of Exceptional/Natural Events in Arizona, 2007 and Request for Concurrence with attached notebook entitled "Exceptional/Natural Events in the State of Arizona, 2007, Public Comment Aug 11 – Sep 10, 2008 with enclosed
	- Table 1, Arizona Air Quality Final Demonstrations for Flagstaff Exceptional Events (2007)
	- Public Notice, Arizona Department of Environmental Quality Request for Public Comments on Natural or Exceptional Events in Arizona
	- Index of 2007 Exceptional Events Demonstrations, Public Comment, 08/11/08 – 09/10/08
	- Figure 1, Key Data for Event of November 29, 2006
	- Assessment of November 29, 2006 Event
	- ADEQ Yuma and Vicinity Dust Control Action Forecast issued Tuesday, November 28, 2006
	- U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, NAF (23199), El Centro, CA (11/2006)
	- U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (11/2006)
	- U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Yuma Marine Corps Air Station/Yuma International Airport (23195), Yuma, AZ (11/2006)
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Yuma Area on February 15, 2006 with attached ADEQ Maricopa County Dust Control Action Forecast issued on Monday, February 13, 2006; U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (02/2006); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Yuma Marine Corps Air Station/Yuma International Airport (23195), Yuma, AZ (02/2006); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, NAF (23199), El Centro, CA (02/2006)
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Yuma Area on May 21, 2006 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (05/2006); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Palm Springs International Airport (93138), Palm Springs, CA (05/2006); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Yuma Marine Corps Air Station/Yuma International Airport (23195), Yuma, AZ (05/2006)
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events

## LIST OF DOCUMENTS

DATE	TITLE
	<p>in the Yuma Area on November 29, 2006</p> <ul style="list-style-type: none"> <li>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub> and PM<sub>2.5</sub>) Concentration Events in the Nogales, Arizona Area on January 1, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (12/2006); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (01/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 12/31/06 and 01/01/07</li> <li>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on January 5, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Thursday, January 4, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, NAF(23199), El Centro, CA (01/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (01/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (01/2007)</li> </ul>
09/16/09 Con't	<ul style="list-style-type: none"> <li>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Nogales, Arizona Area on February 6, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (02/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 02/06/07</li> <li>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on February 19, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Sunday, February 18, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, NAF(23199), El Centro, CA (02/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (02/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (02/2007); NOAA HYSPLIT Model, Forward Trajectory Starting at 03 UTC 19 Feb 07, EDAS Meteorological Data</li> <li>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on February 27, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Monday, February 26, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, NAF(23199), El Centro, CA (02/2007); U.S. Department of</li> </ul>

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DATE	TITLE
	Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (02/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Yuma MCAS (01345), Yuma, AZ (02/2007); NOAA HYSPLIT Model, Forward Trajectory Starting at 22 UTC 27 Feb 07, EDAS Meteorological Data
09/16/09 Con't	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on March 6, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (03/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 03/06/07
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on March 15, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (03/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 03/15/07
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Yuma Area on April 11, 2007 and Statewide on April 12, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Wednesday, April 11, 2007; ADEQ Maricopa County Dust Control Action Forecast issued Wednesday, April 11, 2007; ADEQ Green Valley and Vicinity Re-Entrainment Risk Wind Forecast issued on Wednesday, April 11, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (04/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (04/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, NAF(23199), El Centro, CA (04/2007)

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DATE	TITLE
	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on May 4, 2007 with attached ADEQ Maricopa County Dust Control Action Forecast issued on Thursday, May 3, 2007; ADEQ Air Quality Forecast for Thursday, May 3, 2007; Local Air Pollutants in Detail; ADEQ Yuma and Vicinity Dust Control Action Forecast issued Thursday, May 3, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, NAF(23199), El Centro, CA (05/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (05/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (05/2007)</p>
09/16/09 Con't	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on May 21, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Sunday, May 20, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (05/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Blythe Airport (23158), Blythe, CA (05/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (05/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, NAF(23199), El Centro, CA (05/2007)</p>
	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on June 5, 2007 and Statewide on June 6, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Monday, June 4, 2007; ADEQ Maricopa County Dust Control Action Forecast issued on Monday, June 4, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (06/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, NAF(23199), El Centro, CA (06/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (06/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Williams Gateway Airport (23104), Phoenix, AZ (06/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Casa Grande Municipal Airport (03914), Casa Grande, AZ (06/2007)</p>
09/16/09 Con't	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Rillito Area on July 5, 2007 with attached ADEQ Green Valley and Vicinity Dust Re-Entrainment Risk Wind Forecast issued Wednesday, July 4, 2007; ADEQ</p>

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DATE	TITLE
	<p>Maricopa County Dust Control Action Forecast issued Monday, July 4, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Tucson International Airport (23160), Tucson, AZ (07/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Davis-Monthan AFB Airport (23109), Tucson, AZ (07/2007)</p> <p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Yuma Area on July 8, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Monday, July 6, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (07/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, NAF(23199), El Centro, CA (07/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (07/2007)</p> <p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Phoenix Area on July 19, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Williams Gateway Airport (23104), Phoenix, AZ (07/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Phoenix Deer Valley Airport (03184), Phoenix, AZ (07/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, Phoenix Sky Harbor International Airport (23183), Phoenix, AZ (07/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Scottsdale Airport (03192), Scottsdale, AZ (07/2007)</p>
09/16/09 Con't	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Phoenix Area on August 13, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Williams Gateway Airport (23104), Phoenix, AZ (08/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Phoenix Deer Valley Airport (03184), Phoenix, AZ (08/2007)</p> <p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Phoenix Area on August 16, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Chandler Municipal Airport (53128), Chandler, AZ (08/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Williams Gateway Airport (23104), Phoenix, AZ (08/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Phoenix Sky Harbor International Airport</p>

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DATE	TITLE
	(23183), Phoenix, AZ (08/2007) - ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on August 23, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Phoenix Sky Harbor International Airport (23183), Phoenix, AZ (08/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Williams Gateway Airport (23104), Phoenix, AZ (08/2007)
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Yuma Area on August 31, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Thursday, August 30, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (08/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, NAF(23199), El Centro, CA (08/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (08/2007)
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Yuma Area on October 5, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Thursday, October 4, 2007; U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (10/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, NAF(23199), El Centro, CA (10/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Imperial County Airport (03144), Imperial, CA (10/2007)
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on October 19, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (10/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 10/19/07
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Yuma and Phoenix Areas on October 21, 2007 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Friday, October 19, 2007; ADEQ Maricopa County Dust Control Action Forecast issued on Friday, October 19, 2007; ADEQ Air Pollution Health Watch Issuance Notice; U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, Yuma MCAS (03145), Yuma, AZ (10/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly

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DATE	TITLE
	<p>Observations Table, Phoenix Goodyear Airport (03186), Goodyear, AZ (10/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Casa Grande Municipal Airport (03914), Casa Grande, AZ (10/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Casa Grande Municipal Airport (03914), Casa Grande, AZ (10/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Luke AFB Airport (23111), Glendale, AZ (10/2007)</p>
	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Phoenix Areas on October 24, 2007 with attached ADEQ Air Pollution Health Watch Issuance Notice; U.S. Department of Commerce Quality Controlled Local Climatological Data (may be updated), Hourly Observations Table, Phoenix Sky Harbor International Airport (23183), Phoenix, AZ (10/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Falcon Field Airport (03185), Mesa, AZ (10/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Williams Gateway Airport (23104), Phoenix, AZ (10/2007); ADEQ Air Quality Division PM<sub>10</sub>.TEOM Daily Concentration Report (ug/m<sup>3</sup>) for 10/24/07</p>
	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Nogales, Arizona Area on October 27, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (10/2007); ADEQ Air Quality Division PM<sub>10</sub>BAM.STD Daily Concentration Report (ug/m<sup>3</sup>) for 10/27/07</p>
	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Nogales, Arizona Area on November 2, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (11/2007); ADEQ Air Quality Division PM<sub>10</sub>BAM.STD Daily Concentration Report (ug/m<sup>3</sup>) for 11/02/07</p>
	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Nogales, Arizona Area on November 3, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (11/2007); ADEQ Air Quality Division PM<sub>10</sub>BAM.STD Daily Concentration Report (ug/m<sup>3</sup>) for 11/03/07</p>
09/16/09 Con't	<p>- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM<sub>10</sub>) Concentration Events in the Nogales, Arizona Area on November 4, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly</p>

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DATE	TITLE
	Observations Table, Nogales International Airport (03196), Nogales, AZ (11/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 11/04/07
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on November 6, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (11/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 11/06/07
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on November 15, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Goodyear Airport (03186), Goodyear, AZ (11/2007); U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Phoenix Sky Harbor International Airport (23183), Phoenix, AZ (11/2007)
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on November 18, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (11/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 11/18/07
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on November 19, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (11/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 11/19/07
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on November 28 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (11/2007); ADEQ Air Quality Division PM10BAM.STD Daily Concentration Report (ug/m3) for 11/28/07
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> and PM <sub>2.5</sub> ) Concentration Events in the Nogales, Arizona Area on December 24, 2007 with attached U.S. Department of Commerce Quality Controlled Local Climatological Data (final), Hourly Observations Table, Nogales International Airport (03196), Nogales, AZ (12/2007); ADEQ Air Quality Division PM10BAM.STD Daily

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DATE	TITLE
	Concentration Report (ug/m3) for 12/24/07 (289 pages)
06/30/09	Letter to Deborah Jordan, EPA, from Nancy Wrona, ADEQ, regarding Submittal of Preliminary Documentation of Exceptional/Natural Events in Arizona 2008 and Request for Concurrence (4 pages)
06/30/09	Notebook as referenced in 06/30/09 letter entitled "Preliminary Documentation for 2008 Exceptional Events" with enclosed
	- Index of 2008 Exceptional Events Preliminary Documentation, Public Comment Period, TBA
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> and PM <sub>2.5</sub> ) Concentration Events in the Nogales, Arizona Area on January 1, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> and PM <sub>2.5</sub> ) Concentration Events in the Nogales, Arizona Area on January 26, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on February 27, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on March 2, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Buckeye Area on March 2, 2008 with attached ADEQ Air Quality Forecast for Saturday, March 1, 2008; ADEQ Maricopa County Dust Control Action Forecast issued Friday, February 29, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Yuma Area on March 2, 2008 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued on Friday, February 29, 2008; ADEQ Air Quality Forecast for Saturday, March 1, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on March 14, 2008 with attached Chapter 4: Overview of PM <sub>10</sub> Control Measures; ADEQ Air Quality Forecast for Friday, March 14, 2008; ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Maricopa County Dust Control Action Forecast issued on Thursday, March 13, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High

## LIST OF DOCUMENTS

DATE	TITLE
	Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on April 16, 2008 with attached Chapter 4: Overview of PM <sub>10</sub> Control Measures; ADEQ Air Quality Forecast for Wednesday, April 16, 2008; ADEQ Maricopa County Dust Control Action Forecast issued on Tuesday, April 15, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on April 30, 2008 with attached Chapter 4: Overview of PM <sub>10</sub> Control Measures; ADEQ Air Quality Forecast for Wednesday, April 30, 2008; ADEQ Maricopa County Dust Control Action Forecast issued on Tuesday, April 29, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Paul Spur Area on May 12, 2008 with attached ADEQ Air Quality Forecast for Monday, May 12, 2008; ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Green Valley and Vicinity Dust Control Re-Entrainment Risk Wind Forecast issued on Sunday, May 11, 2008; ADEQ Maricopa County Dust Control Action Forecast issued, Sunday, May 11, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on May 18, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix and Yuma Areas on May 21, 2008 with attached ADEQ Air Quality Forecast for Wednesday, May 21, 2008; ADEQ Yuma and Vicinity Dust Control Action Forecast issued on Tuesday, May 20, 2008; Chapter 4: Overview of PM <sub>10</sub> Control Measures; Local Air Pollutants in Detail; ADEQ Maricopa County Dust Control Action Forecast issued on Tuesday, May 20, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on May 22, 2008 with attached ADEQ Maricopa County Dust Control Action Forecast issued on Wednesday, May 21, 2008; ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Green Valley and Vicinity Dust Control Re-Entrainment Risk Wind Forecast issued on Wednesday, May 21, 2008; ADEQ Yuma and Vicinity Dust Control Action Forecast issued, Wednesday, May 21, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix and Yuma Areas on June 4, 2008 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued on Tuesday, June 3, 2008; ADEQ Maricopa County Dust Control Action Forecast issued on Tuesday, June 2, 2008 (NOTE day of week appears to be incorrect on one of these entries); ADEQ Air Pollution Health Watch Issuance Notice

## LIST OF DOCUMENTS

DATE	TITLE
06/30/09 Con't	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Buckeye Area on July 1, 2008 with attached ADEQ Air Quality Forecast for Tuesday, July 1, 2008; Local Air Pollutants in Detail; ADEQ Maricopa County Dust Control Action Forecast issued on Monday, June 30, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Buckeye Area on July 4, 2008 with attached ADEQ Maricopa County Dust Control Action Forecast issued on Thursday, July 3, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on October 11, 2008 with attached ADEQ Maricopa County Dust Control Action Forecast issued on Tuesday, October 10, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on October 22, 2008 with attached ADEQ Maricopa County Dust Control Action Forecast issued on Tuesday, October 21, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on October 26, 2008
06/30/09 Con't	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Pima County Area on October 27, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Nogales, Arizona Area on October 31, 2008 and November 1, 2008
	- Description of High Particulate (PM <sub>10</sub> ) Concentration Event in the Durango Complex Vicinity on November 7, 2008 with attached Maricopa County, Air Quality Division, Dust Control Division, Photo Attachment Page, 11/14/08; ADEQ Air Quality Forecast for Friday, November 7, 2008; ADEQ Maricopa County Dust Control Action Forecast issued Thursday, November 6, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate Concentration Event in the Nogales, Arizona Area on November 8, 2008 with attached ADEQ Yuma and Vicinity Dust Control Action Forecast issued Friday, November 7, 2008; ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Maricopa County Dust Control Action Forecast issued Friday, November 7, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for

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DATE	TITLE
	Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix and Yuma Areas on November 9, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate Concentration Event in the Nogales, Arizona Area on November 16, 2008 and November 17, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate Concentration Event in the Nogales, Arizona Area on November 20, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate Concentration Event in the Nogales, Arizona Area on November 22, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate Concentration Event in the Nogales, Arizona Area on December 20, 2008
	- Preliminary Documentation, ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> and PM <sub>2.5</sub> ) Concentration Events in the Nogales, Arizona Area on December 31, 2008 and January 1, 2009 (211 pages)
09.11/09	Letter to Gina McCarthy, EPA, from Martin Bauer, Western States Air Resources Council (WESTAR), regarding Recommendations to Improve Implementation of the Exceptional Events Rule with enclosed -
	- Recommended Actions to Improve Implementation of 40 CFR Parts 50 and 51 Related to Treatment of Data Influenced by Exceptional Events (10 pages)
11/17/09	Letter to Deborah Jordan, EPA, from Nancy Wrona, ADEQ, regarding Submittal of Final Demonstrations of the 2008 Greater Phoenix Area Exceptional/Natural Events and Request for Concurrence with enclosed -
	- ADEQ The Impact of Exceptional Events 'Unusual Winds' on PM <sub>10</sub> Concentrations in Arizona, Air Quality Division, October 15, 2009
	- ADEQ High Wind Exceptional Events And Control Measures for PM <sub>10</sub> Areas, Air Quality Division, October 13, 2009 (33 pages)
11/17/09	Notebook referenced in 11/17/09 letter entitled "Exceptional/Natural Events in the Greater Phoenix Area 2008, Public Comment Period Oct 15 – Nov 13, 2009 with enclosed –
	- Index of 2008 Greater Phoenix Area Exceptional Events Demonstrations Public Comment Period, October 15 – November 13, 2009
	- Affidavit of Publication dated 10/15/09
	- Two page Spreadsheet from 03/02/08 to 11/09/08 – Definition of "High Wind" as a "Natural Event" as described in 40 CFR 50.1(k) and Preamble section IV(E)(5)(a)
	- ADEQ Assessment of Qualification for Treatment under the Arizona

## LIST OF DOCUMENTS

DATE	TITLE
	Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Buckeye Area on March 2, 2008 with attached ADEQ Air Quality Forecast for Saturday, March 1, 2008; ADEQ Maricopa County Dust Control Action Forecast issued Friday, February 29, 2008; ADEQ Yuma and Vicinity Dust Control Action Forecast issued Friday, February 29, 2008
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on March 14, 2008 with attached ADEQ Air Quality Forecast for Friday, March 14, 2008; ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Maricopa County Dust Control Action Forecast issued Thursday, March 13, 2008; Chapter 4: Overview of PM <sub>10</sub> Control Measures
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on April 16, 2008 with attached ADEQ Air Quality Forecast for Tuesday, April 15, 2008; Local Air Pollutants in Detail; ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Maricopa County Dust Control Action Forecast issued Monday, April 14, 2008; ADEQ Air Quality Forecast for Wednesday, April 16, 2008; ADEQ Maricopa County Dust Control Action Forecast issued Tuesday, April 15, 2008; Chapter 4: Overview of PM <sub>10</sub> Control Measures
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on April 30, 2008 with attached ADEQ Air Quality Forecast for Wednesday, April 30, 2008; ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Maricopa County Dust Control Action Forecast issued Tuesday, April 29, 2008; Chapter 4: Overview of PM <sub>10</sub> Control Measures
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix and Yuma Areas on May 21, 2008 with attached ADEQ Air Quality Forecast for Wednesday, May 21, 2008; Local Air Pollutants in Detail; ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Maricopa County Dust Control Action Forecast issued Tuesday, May 20, 2008; ADEQ Yuma and Vicinity Dust Control Action Forecast issued Tuesday, May 20, 2008; Chapter 4: Overview of PM <sub>10</sub> Control Measures
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix and Yuma Areas on June 4, 2008 with attached ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Maricopa County Dust Control Action Forecast issued Tuesday, June 2, 2008; ADEQ Yuma and Vicinity Dust Control Action Forecast issued Tuesday, June 3, 2008 (NOTE day of week appears to be incorrect on one of these entries); PM <sub>10</sub> Control Measures Reporting Form High Wind Exceptional Event Demonstration, June 4, 2008
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Buckeye Area on July 1, 2008 with attached ADEQ Air Quality Forecast for Tuesday, July 1, 2008; Local Air Pollutants in Detail; ADEQ Maricopa

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DATE	TITLE
	County Dust Control Action Forecast issued Monday, June 30, 2008
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Buckeye Area on July 4, 2008 with attached ADEQ Maricopa County Dust Control Action Forecast issued Thursday, July 3, 2008
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on October 11, 2008 with attached ADEQ Maricopa County Dust Control Action Forecast issued Friday, October 10, 2008
	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix Area on October 22, 2008 with attached ADEQ Maricopa County Dust Control Action Forecast issued Tuesday, October 21, 2008
	- Description of the High Particulate (PM <sub>10</sub> ) Concentration Event in the Durango Complex Vicinity on November 7, 2008 with attached ADEQ Air Quality Forecast for Friday, November, 7, 2008; ADEQ Maricopa County Dust Control Action Forecast issued Thursday, November 6, 2008; Maricopa County, Air Quality Division, Dust Control Division, Photo Attachment Page, 11/14/08
11/17/09 Con't	- ADEQ Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix and Yuma Areas on November 9, 2008 with attached ADEQ Air Pollution Health Watch Issuance Notice; ADEQ Maricopa County Dust Control Action Forecast issued Friday, November 7, 2008; ADEQ Yuma and Vicinity Dust Control Action Forecast issued Friday, November 7, 2008
	- ADEQ High Wind Exceptional Events and Control Measures for PM <sub>10</sub> Areas, Air Quality Division, October 13, 2009
	- ADEQ The Impact of Exceptional Events 'Unusual Winds' on PM <sub>10</sub> Concentrations in Arizona, Air Quality Division, October 14, 2009 (209 pages)
03/08/10	Letter to Martin Bauer, Western States Air Resources Council (WESTAR), from Gina McCarthy, EPA, regarding response to 09/11/09 letter providing recommendations of WESTAR's "Exceptional Event Rules" (2 pages)
07/20/10	E-mail from Ira M. Domskey to Roger Ferland with cc's to Eric Massey, Shawn B. Kendall and <a href="mailto:james.skardon@azag.gov">james.skardon@azag.gov</a> attaching ADEQ's Draft Supplemental Report, Assessment of Qualification for Treatment Under the Federal Exceptional Events Rule: High Particulate (PM <sub>10</sub> ) Concentration Events in the Phoenix and Yuma Areas on June 4, 2008, Air Quality Division dated March 17, 2010 and sent to the EPA by ADEQ on March 17, 2010 (37 pages)
05/21/10	Letter from Jared Blumenfeld, EPA, to Benjamin H. Grumbles, ADEQ, regarding PM <sub>10</sub> Natural Ambient Air Quality Standard in Phoenix Request for Concurrence for Treatment as "Exceptional Events" with enclosed Review of Exceptional Event Request (ADEQ File Folder tab noted "May 21, 2010 Letter from EPA to ADEQ Non-Concurrence) with enclosed -

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DATE	TITLE
	- Review of Exceptional Event Request, Maricopa County, AZ, 24-Hour PM <sub>10</sub> , March 14, 2008, April 30, 2008, May 21, 2008, June 4, 2008, U.S. Environmental Protection Agency Region 9, May 12, 2010 (48 pages)
06/30/10	Letter from Benjamin H. Grumbles, ADEQ, to Jared Blumenfeld, EPA, regarding response to concerns raised in 05/21/10 letter and at the 05/25/10 meeting with attached Section by Section Response to Review of Exceptional Events Request, Maricopa County, AZ 24-Hour PM <sub>10</sub> , March 14, 2008, April 30, 2008, May 21, 2008, June 4, 2008 U.S. Environmental Protection Agency Region 9, May 12, 2010, prepared by ADEQ June 17, 2010 (108 pages)
07.02/10	Letter from Benjamin H. Grumbles, ADEQ, to Jared Blumenfeld, EPA, regarding transmittal of comments prepared by Maricopa County Association of Governments (MAG) with attached MAG Responses to EPA's Review of Exceptional Event Request, Maricopa County, AZ, May 12, 2010 (30 pages)
07/06/10	Letter from Dave Klemp, WESTAR, to Gina McCarthy, EPA, regarding response to 09/11/09 letter (ADEQ File Folder tab noted "July 6, 2010 WESTAR letter to EPA") (2 pages)
08/02/10	08/02/10 Letter from Benjamin H. Grumbles, ADEQ, to Jared Blumenfeld, EPA, transmitting a revised draft report raised by ADEQ on 06/04/08 (2 pages)
	Spiral bound report entitled "ADEQ Assessment of Qualification for Treatment under the Federal Exceptional Events Rule: High Particulate (PM <sub>10</sub> ) Concentration Events in Phoenix and Yuma Areas on June 4, 2008, Air Quality Division, July 30, 2010 (412 pages)
08/02/10	Letter from Benjamin H. Grumbles, ADEQ, to Lisa Jackson, EPA, providing comments on the proposed Consent Decree (EPA-HQ-OGC-2010-0428) with attached July 6, 2010 WESTAR letter; March 17, 2010 ADEQ draft Supplemental Report; June 30, 2010 ADEQ Response to EPA May 21, 2010 letter with its own enclosure; July 2, 2010 ADEQ transmission of MAG comments; August 2, 2010 ADEQ transmission of letter and Supplemental Report for June 4, 2008 event (letter references attachments although unable to locate attachments behind letter) (4 pages)
08/24/10	Letter from Jared Blumenfeld, EPA, to Benjamin H. Grumbles, ADEQ, regarding recent communications about exceptional events dated June 30, July 2 and August 2 as well as 08/02/10 comments on proposed consent decree (1 page)
08/27/10	Letter from Benjamin H. Grumbles, ADEQ, to Jared Blumenfeld, EPA, continuing correspondence dated 08/02/10 and attaching newly-updated revised draft June 4, 2008 report (8 pages) with enclosed – - Summary of Changes Made to Assessment of Qualification for Treatment under the Federal Exceptional Events Rule: High Particulate Matter (PM <sub>10</sub> ) Concentration Events in the Phoenix and Yuma Areas on June 4, 2008 (dated July 30, 2010)

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DATE	TITLE
	- Exceptional Event Information Needed to Determine The Contribution of Anthropogenic Activities
	- August 16, 2010 Assessment of Qualification for Treatment under the Federal Exception Events Rule: High Particulate (PM <sub>10</sub> ) Concentration Event in the Phoenix Area on March 14, 2008 (346 pages)
	- August 16, 2010 Assessment of Qualification for Treatment under the Federal Exception Events Rule: High Particulate (PM <sub>10</sub> ) Concentration Event in the Phoenix Area on April 30, 2008 (360 pages)
	- August 16, 2010 Assessment of Qualification for Treatment under the Federal Exception Events Rule: High Particulate (PM <sub>10</sub> ) Concentration Event in the Phoenix Area on May 21, 2008 (382 pages)
	- August 16, 2010 Assessment of Qualification for Treatment under the Federal Exception Events Rule: High Particulate (PM <sub>10</sub> ) Concentration Event in the Phoenix Area on June 4, 2008 (408 pages)
09/01/10	Letter from Benjamin H. Grumbles, ADEQ, and Dennis Smith, MAG, to Honorable Lisa Jackson, EPA, regarding EPA Policy regarding Implementation of the Exceptional Events Rule (8 pages)



Janice K. Brewer  
Governor

# ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

1110 West Washington Street • Phoenix, Arizona 85007  
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Benjamin H. Grumbles  
Director

October 20, 2010

## VIA U.S. MAIL AND ELECTRONIC MAIL

Docket Number EPA-R09-OAR-2010-0715  
EPA Docket Center  
Environmental Protection Agency, Mailcode 2822T  
1200 Pennsylvania Ave, N.W.  
Washington, DC 20460-001

Re : Comments on Docket ID Number EPA-R09-OAR-2010-0715: Proposed Partial Approval  
Partial Disapproval of the Maricopa Area 5% Plan

### To Whom It May Concern:

The Arizona Department of Environmental Quality (ADEQ) provides the following comments on the proposed partial approval and partial disapproval of the Maricopa Area 5% plan in Docket ID Number EPA-R09-OAR-2010-0715. This proposed action would partially approve portions of the "MAG 2007 Five Percent Plan for PM-10 for the Maricopa County Nonattainment Area" (the 5% Plan) developed by the Maricopa Association of Governments in 2007, and submitted by the State of Arizona to EPA as a revision to the State Implementation Plan (SIP) for the Maricopa County serious PM-10 non-attainment area.

In July 2000, ADEQ submitted Arizona Administrative Code Title 18, Chapter 2, Article 6 Sections 610 and 611 (A.A.C. R18-2-610 and -611) to EPA along with a demonstration that the Agricultural Best Management Practices (Ag BMP) program met all of the Clean Air Act's requirements. In October 2001 and July 2002 EPA approved these rules as Best Available Control Measures (BACM) for agricultural practices within the Maricopa County serious PM-10 non-attainment area. In 2007, the Arizona Legislature passed Senate Bill 1552 which amended the statute (A.R.S. § 49-457) that authorized the Ag BMP program, increasing the number of control measures required by the Program, and also expanded the program's applicability to agricultural activities within the Maricopa County serious PM-10 non-attainment area.

EPA's proposed action would partially approve the 2007 amendments to A.R.S § 49-457 which strengthen the Ag BMP program and the SIP. ADEQ supports this finding. At the same time, however, EPA's proposed action would disapprove A.A.C. R18-2-610 and -611 because, according to EPA, the definitions within the rules are too broad, and because there is no mechanism in the rule to ensure that the emission reduction measures are achieving the required levels of control. Although ADEQ disagrees that the definitions are too broad, we will continue working with EPA and the Governor's Ag BMP Committee to provide additional specificity.

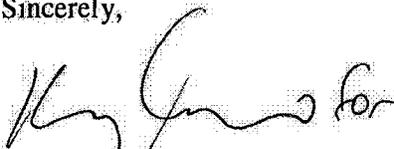
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ADEQ has signed a joint comment letter to Administrator Jackson along with the Maricopa Association of Governments (MAG) and the Maricopa County Air Quality Department (MCAQD). This letter identifies the fact that many of the days that exceeded the national air quality standard for PM-10 have been flagged as exceptional events that have overwhelmed the best available and most stringent control measures that have been required within the area. ADEQ's position regarding the documentation for the four days in 2008 with which EPA has not concurred is well documented. It is important to note, however, that on October 19, 2010, ADEQ sent the final documentation regarding the March 14, April 30, May 21, and June 4, 2008 events to EPA Regional Administrator Jared Blumenfeld. These final documents successfully completed the public notice process required by the Exceptional Events Rule, and are incorporated by reference into this letter.

The efforts of ADEQ, MAG, MCAQD and the many stakeholders implementing the 5% Plan have successfully reduced the impacts of air pollution in Maricopa County. ADEQ believes that the 5% Plan, including measures such as the Agricultural Best Management Practices program, has been successfully implemented in Maricopa County, and that the controls required by that plan have resulted in many positive benefits to public health. We also recognize, however, that there are opportunities to improve and ADEQ is committed to making such improvements to the 5% Plan. If you have any questions, please contact Eric Massey, the Director of the Air Quality Division, at (602) 771-2308.

Sincerely,

A handwritten signature in black ink, appearing to read "Benjamin H. Grumbles for". The signature is fluid and cursive.

Benjamin H. Grumbles  
Director

cc: Gregory Nudd, EPA  
Dennis Smith, Maricopa Association of Governments  
William Wiley, Maricopa County Air Quality Department



# Maricopa County

Air Quality Department

Office of the Director  
William D. Wiley  
Director  
1001 North Central Avenue  
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October 20, 2010

**Via Email: [nudd.gregory@epa.gov](mailto:nudd.gregory@epa.gov)**  
Gregory Nudd (Air-2)  
U.S. Environmental Protection Agency Region IX  
75 Hawthorn Street  
San Francisco, CA 94105-3901

Subject: Docket ID No. EPA-R09-OAR-2010-0715

**Re: Maricopa County (Phoenix) PM-10 Nonattainment Area; Serious Area Plan for Attainment of the 24-hour PM-10 Standard; Clean Air Act Section 189 (d)**

Dear Mr. Nudd:

The Maricopa County Air Quality Department (MCAQD) offers the following comments regarding the proposed rule published in the federal register on September 9, 2010 (75 FR 54806). In that notice, the U.S. Environmental Protection Agency (EPA) proposes to approve in part and disapprove in part State Implementation Plan (SIP) revisions submitted to meet the Clean Air Act (CAA) Section 189(d) requirements applicable to the serious Maricopa County (Phoenix) nonattainment area.

MCAQD's first priority is protection of the health of our citizens. We believe the 2007 5% Plan submittal was an aggressive approach to improve air quality for the health of our citizens and that it is working. We also acknowledge there are always opportunities to improve air quality and we reiterate our willingness to work with EPA in a collaborative process. We urge EPA to consider the significant impacts of its decision on this plan given these difficult economic times. In this vein, we also encourage EPA to exercise its discretion and ensure that any conformity "freeze" that might occur begin at least 90 days after the effective date of the final action.

MCAQD supports EPA's approval of the various provisions of state statute relating to the control of PM-10 emissions in Maricopa County. However, we believe that several aspects of the proposed disapproval are flawed. Our primary concerns with the proposed action are enumerated below.

1. EPA's disapproval of the Emissions Inventory in the 5% Plan is unsupported by EPA's own guidance on inventories and on rule effectiveness (RE).
  - A. The methodology used by MCAQD does not conflict with any current or previous RE guidance published by EPA.

The methodology used by MCAQD in the 2005 Periodic Emissions Inventory (PEI) applied the principles of EPA's current and previous guidance documents in developing the RE studies. It is important to note that EPA does not find that the RE methodology used in the

2005 Periodic Emissions Inventory (PEI) conflicts with, or runs contrary to guidance on the development of RE studies. The disapproval only states a preference for a newer methodology than that used in the 2005 PEI. EPA guidance on RE studies focuses on broad principles and does not include prescriptive methodologies. As an illustration of this point, EPA states within the current RE guidance that the older guidance upon which MCAQD relied on in crafting the RE study in the 2005 Periodic Inventory can be helpful in calculating emission reductions.<sup>1</sup> EPA also recognizes within the current RE guidance that the development of RE studies is a difficult task due to availability of data and the agency resources. Also note that, at the time our RE study was developed (and even currently), there has been no other agency that has produced an RE study for EPA that focuses on PM-10 from fugitive dust sources beyond a generic assignment of 80% as recommended by older EPA guidance. EPA acknowledges this difficulty in its most recent guidance, as stated below.

*It is unlikely that all state and local agencies will be able to collect sufficient information from all of their stationary sources from which refined RE adjustments can be made. Additionally, no suitable matching studies may exist from which a rule effectiveness value can be obtained. In such situations, the selection of an RE value becomes subjective.<sup>2</sup>*

A number of factors affect both methodologies and may impact an agency's ability to develop a refined RE adjustment. EPA described its concerns with the RE study in the 2005 PEI in the disapproval notice; so we provide the following comments on EPA's observations.

In developing the RE study in the 2005 PEI, MCAQD developed a protocol that sought to minimize the inherent subjectivity of RE studies noted by EPA above. In many ways, the RE study developed for the 2005 PEI is superior to simply looking at a database of inspection records by providing more detailed information than basic records of inspections can provide. This study utilized inspection personnel at each of the 63 visits, both an inspector and a supervising inspector, to ensure that the observations regarding violations of the rule by MCAQD staff were quality assured and accurate. Each site had a full-scale Level 2 inspection to determine compliance with every applicable rule subsection. This level of quality assurance does not exist when simply reviewing a database of inspection records, where a significant portion of the database reflects results from less comprehensive partial or Level 1 inspections. Level 1 inspections are commonly done as spot inspections for violation follow-up, complaint inspections or are drive-by visual inspection of the site. The follow-up inspections in particular have a higher compliance rate as the site is already aware an inspector will return to determine the compliance status of any previously identified deficiencies. Thus compliance levels would be higher when compared to the intensive inspections process used at our 63 sampled sites that we used in our 2005 inventory.

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<sup>1</sup> Page B-5 of current guidance ("Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations," EPA-454/R-05-001, November 2005) states, "How can I calculate SIP credit for emission reductions achieved via improvements to rule effectiveness? Such credit will need to be determined on a case by case basis. EPA's older guidance may be used as a point of reference, but pursuant to EPA guidance, "Ozone Nonattainment Planning: Decentralization of Rule Effectiveness Policy; April 27, 1995", other approaches may be used."

<sup>2</sup> "Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations," EPA-454/R-05-001, November 2005

Another factor which needs to be considered is the effect of meteorology on the compliance inspection rate in the overall database. While the region's meteorology affects all fugitive dust sources, its impact is most significant for vacant lots and other unpermitted, unpaved sources of fugitive dust. Our field studies, which we used in the 2005 inventory, took place during periods of the year when Maricopa County ambient monitors typically record exceedances of the 24-hour PM-10 standard. MCAQD believes that compliance rates during the periods when exceedances are most likely to be recorded provide an appropriate, conservative estimate of rule effectiveness.

In conclusion, both the methodology used by MCAQD and that proposed by EPA in its disapproval may be affected by factors that impact the validity of the results. We believe the choice between them is not as clear cut as outlined in EPA's comments. Based on our analysis, we believe the RE study developed by MCAQD for the 2005 PEI met all available EPA guidance and was the best available estimate of the effectiveness of the rules it evaluated.

**B. EPA's preference for the use of a single metric, the compliance rate, in determining rule effectiveness is inconsistent with its own guidance.**

In footnotes 8 and 10 of the Federal Register notice, on page 54809 discussing rule effectiveness study methodology, EPA indicates concern with the use of qualitative factors in calculating rule effectiveness (75 FR 54809). This observation is inconsistent with EPA's own RE guidance documents as quoted above and shown below. Furthermore, MCAQD has made a concerted effort in its RE studies to use all available compliance data in the study period to produce a compliance rate that is statistically valid, pragmatically defensible and is in conformance with current EPA guidance regarding rule effectiveness. MCAQD agrees that the compliance rate is the most important factor in determining a source-specific RE percentage and heavily weighted (70%) the compliance rate in the calculation of RE. However, MCAQD also agrees with current and past EPA guidance repeatedly states that compliance rates should not be the only factor in determining an overall RE rate, as typified by this excerpt from EPA's 1994 guidance on RE<sup>3</sup>:

*"A percentage effectiveness rating is not enough to describe the compliance effectiveness of a rule for a source category. An SSCD study should attempt to link the rating to a regulatory agency's overall effort. The study should address the factors that affect the percentage effectiveness rating such as the compliance rate of the sources in a category, inspection frequency and thoroughness, the language of the rule (i.e., whether or not it has loopholes), and the reporting and recordkeeping by the regulatory agency. Evaluating these factors will provide a more complete evaluation of the effectiveness of a rule." (p. 3-17)*

In summary, EPA's preference for using only the compliance rate to make RE adjustments does not acknowledge all of the program elements that are necessary to obtain the emission reductions anticipated from control measures nor the difficulty in obtaining sufficient information to characterize all of those program elements in a study. EPA's own 2005 RE guidance provides a methodology to appropriately characterize RE for Rule 316 and for the 2008 RE study for Rules 310, 310.01 and 316. MCAQD's methodology has developed an RE adjustment that is statistically valid, pragmatically defensible and is in conformance with current EPA guidance regarding rule effectiveness.

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<sup>3</sup> "Rule Effectiveness Guidance: Integration of Inventory, Compliance, and Assessment Applications," EPA-452/4-94-001, January 1994.

**C. EPA's statement regarding the rule effectiveness calculations for Rule 310.01 did not provide the correct value for the rule effectiveness rate. (75 FR 54809)**

EPA incorrectly quotes a value of 90% for a back-casting of rule effectiveness for Rule 310.01 from the Poppen email.<sup>4</sup> An examination of the Poppen email shows that rule effectiveness for Rule 310.01 was back-casted at 77.5 percent, not 90 percent as quoted by EPA. The 90 percent quoted by EPA refers to the compliance rate, not the final rule effectiveness rate.

**D. EPA did not identify any specific issues on the rule effectiveness study throughout its development and use in the 2005 periodic emission inventory when it was out for public review and comment in January 2007.**

MCAQD published the entire 2005 emission inventory documentation for public review and comment in January 2007. The comments provided by EPA Region 9 on the draft 2005 PEI made no mention of the RE study but only remarked briefly on changing the assumptions about the activity level of construction sources (Rule 310).<sup>5</sup> However, several prominent industry groups including the Arizona Chapter of Associated General Contractors and the Home Builders Association of Central Arizona commented extensively on the draft RE study. Several of the comments provided by the above mentioned parties even cover in particular detail the discussion of random sample inspections versus the use of available inspection data. MCAQD provided extensive response to these comments, detailing the decisions that went into choosing sample inspections over inspection data in developing the RE study. If EPA had concerns with the RE study or its methodology during its development, it did not advise MCAQD during this period nor did it take the opportunity to agree with the comments in support of using inspection data over sample inspections.

**E. EPA is relying on hindsight to evaluate the inventory.**

EPA has historically defended such inventories in states' plan submittals, protecting the states from endless delays and costs occurred from adjusting inventories each time new data and methodology appear. It has been over 3 years since the 2005 PEI was finalized in May 2007. EPA's concerns with the RE studies is a recent development and appeared only after MCAQD developed a new methodology for evaluating RE for the 2008 PEI (released in the spring of 2010). Given EPA's involvement in the 2005 PEI, we were surprised that EPA did not support it in the September 9, 2010 proposed rule. Note that it is common place for EPA to approve plans that do not even contain rule effectiveness studies. EPA states in the May 2005 approval of the District of Columbia's VOC rule that,

*"As numerous of EPA's SIP approval Final actions published in the Federal Register amply demonstrate, EPA has approved hundreds of SIP revisions submitted by states consisting of state rules*

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<sup>4</sup> Email from Matthew Poppen, MCAQD, to Gregory Nudd, EPA, "Backcasting of RE rates," April 19, 2010 (Poppen email).

<sup>5</sup> In "Appendix 1, Responsiveness Summary to Comments Received on Public Review Draft 2005 Periodic Emissions Inventory for PM<sub>10</sub> for the Maricopa County, Arizona, Nonattainment Area" of the 2005 Periodic Emissions Inventory for PM<sub>10</sub> for the Maricopa County, Arizona, Nonattainment Area. MCAQD, May 2007

*to control VOCs from stationary sources and source categories where such approvals did not require data and modeling to assess the individual rules' impacts on the NAAQS.*<sup>6</sup>

In hindsight, it is understandable the EPA would wish to minimize the role of construction emissions given the recent deep economic recession experienced by the industry. However, during the time the 2005 Periodic Inventory was developed, construction activity was robust and there was no obvious indication that the industry would experience the coming recession. EPA has historically supported states' RE methodology based on economic realities that were present at the time of their submission.

As an illustration of this point, in its May 2004 approval of the San Joaquin Valley's Serious Area Plan for PM-10, EPA states the following in response to a comment that the emissions inventory used by San Joaquin Valley contained numerous errors,

*"...EPA recognizes that inventories are not static, but are constantly being updated and renewed as new information, techniques and studies are made available.<sup>16</sup> The State and District used the best available inventories at the time of plan development...EPA generally relied on the State and local agencies to develop, maintain and update their inventories...<sup>16</sup>Once a plan has been adopted, EPA does not generally require plan elements such as emissions inventories to be revisited and updated in response to new information. The U.S. Court of Appeals for the District of Columbia Circuit recently addressed a similar issue and affirmed EPA's position. *Sierra Club v. EPA*, 356 F.3d 296 (D.C. Cir. 2004).<sup>17</sup>*

As this quote demonstrates, EPA felt strongly enough about using the "best available inventories at the time of plan development" to defend that position.<sup>8</sup> We agree that this is

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<sup>6</sup> 70 FR 24963

<sup>7</sup> 69 FR 30013

<sup>8</sup> The following prevailing opinion from Judge Garland in the court case cited by EPA (*Sierra Club v. EPA*, 356 F.3d 296 (D.C. Cir. 2004)) highlights EPA's defense of the use of the best available inventory at the time of plan development, "**44** *Sierra Club* argues that the States should nonetheless have revised the D.C. area ROP plans to incorporate the advances of MOBILE6, for two reasons. First, MOBILE6 was available, albeit for only one month, before the States submitted their plans. Second, EPA did not approve the plans until April 17, 2003, over a year after MOBILE6's release. **45** EPA responds that, although it requires that states use the latest model available at the time a plan is developed, see 42 U.S.C. § 7502(c)(3); 40 C.F.R. § 51.112(a)(1), its policy was not to "require states that have already submitted SIPs or will submit SIPs shortly after MOBILE6's release to revise these SIPs simply because a new motor vehicle emissions model is now available." Conditional Approval, 68 Fed.Reg. at 19,121; see also Memorandum from EPA Office 356 F3d 296 *Sierra Club v. Environmental Protection Agency of Air Quality Planning & Standards 2* (Jan. 18, 2002) (J.A. at 530) (same). As the agency explains, "emissions factors, as well as inventory calculation methodologies, are continually being improved." 68 Fed.Reg. at 19,120. Indeed, as its name suggests, MOBILE5 is the fifth generation of this particular model; MOBILE6 is the sixth. To require states to revise completed plans every time a new model is announced would lead to significant costs and potentially endless delays in the approval processes. EPA's decision to reject that course, and to accept the use of MOBILE5 in this case, was neither arbitrary nor capricious." (emphasis added).

the position EPA should hold, and it is the position it is ignoring by using hindsight to judge the 2005 PEI.

As a result, our expectation that our emissions inventory would be acceptable to EPA is realistic and consistent with the way that EPA has treated other similarly situated states.

## **2. Exceptional Events Demonstration**

### **A. MCAQD requests that EPA Region IX revisit its May 21, 2010 decision not to concur with ADEQ's exceptional events documentation.**

MCAQD supports the revised and supplemental documentation the Arizona Department of Environmental Quality (ADEQ) submitted regarding exceptional events for exceedances measured on March 14, 2008, April 30, 2008, May 21, 2008, and June 4, 2008. MCAQD further requests that EPA revisit its May 21, 2010 decision not to concur with ADEQ's exceptional event documentation prior to the disapproval of the 5% Plan. Based upon information in these additional documents, there is ample evidence that would have addressed the concerns EPA expressed in its May 21, 2010 non-concurrence.

### **B. A more workable approach to implementing the Exceptional Events Rule is needed.**

Arizona's experience with the exceptional event demonstration process has revealed a lack of clarity in the Exceptional Event Rule (EER) and confusion and uncertainty in the implementation of the EER. On October 20, 2010, MCAQD also signed joint comments with ADEQ and MAG that provide further recommendations on the EER and EPA's consideration of our exceptional events documentation. MCAQD also supports the September 11, 2009 recommendations from WESTAR, as well as those from the California Air Resources Board as to how the implementation of the EER might be improved. MCAQD urges EPA to follow through on EPA's commitments to work with Arizona, WESTAR and other states to develop a more workable approach to implementing the EER.

## **3. Conclusion**

EPA's proposed partial disapproval of the 5% Plan is inappropriate when considering the timing of EPA's decision and actual number of exceedances within Maricopa County. All non-attainment area plans are precisely that – plans. Plans are developed using the best available information about the conditions that exist at the time of development. This information is then projected into the future utilizing the best assumptions about what is likely to occur in the future. We believe the 2005 periodic emission inventory met all EPA requirements and was appropriate for the 2007 5% Plan.

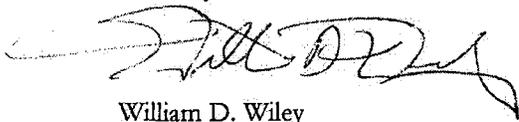
We are committed to the protection of our air for the health of our citizens and as shown in the joint letter from ADEQ, MAG and the county, we believe the 2007 5% Plan is working. We also acknowledge that there are always opportunities to improve air quality and we reiterate our willingness to work with EPA in a collaborative process. We again urge EPA to consider the significant impacts of its decision on this plan given these difficult economic times.

MCAQD appreciates the opportunity to comment on this proposed rulemaking. If you have any questions regarding these comments, please contact Jo Crumbaker of my staff at (602) 506-6705 or me at (602) 506-6701.

October 20, 2010

Page 7 of 7

Sincerely,

A handwritten signature in black ink, appearing to read "William D. Wiley", written over a horizontal line.

William D. Wiley  
Director

Cc: Benjamin Grumbles, Arizona Department of Environmental Quality  
Dennis Smith, Maricopa Association of Governments

Ken Buchanan  
Assistant County  
Manager

Development Services

Don Gabrielson  
Air Quality Director

Fritz Behring  
County Manager



October 20, 2010

via e-mail to nudd.gregory@epa.gov

Gregory Nudd (Air-2)  
Attention Docket ID No. EPA-HQ-OAR-2010-0715  
Environmental Protection Agency Region IX  
75 Hawthorned Street  
San Francisco, CA 94105-3901

Re: Pinal County Comment; Proposed Disapproval of the PPA 5% Plan

To whom it may concern:

1. Background

The Apache Junction portion of Pinal County<sup>1</sup> constitutes a part of the Phoenix Planning Area PM-10 Serious Nonattainment Area.

Pinal County has concern regarding a number of aspects of the EPA's proposed actions, including the impending application of various punitive measures.

The proposed action affects Pinal County.

2. Objection to Conflicts with Clean Air Act Requirements

Given the EPA's express acknowledgement of inclusion of Arizona's Agricultural Best Management Practices Program, namely A.R.S. §49-457, as an element of the plan under review, any final action will necessarily rest in part on that statute.

In the past, the State of Arizona submitted A.R.S. §49-457 as an element of the assemblage of documents that comprise the curative Phoenix-Area PM-10 SIP. Among other measures, the implementing rules allow but do not require certain measures to mitigate PM-10 emissions resulting from wind erosion. See A.A.C. R18-2-611.

However, since the submittal of A.R.S. §49-457 as a SIP element, that statute was recently twice amended. A.R.S. §49-457 (2009), as amended by Laws 2009, First Regular Session, 2009, Chapter 180 (a.k.a. SB 1225); A.R.S. §49-457 (2010), as amended by Laws 2010, Second Regular Session, Chapter 207 (a.k.a. SB 1193). The substance of those amendments was to establish a preemption in current or future PM-10 nonattainment areas of any local rules pertaining to the regulation of agriculture. Those local rules were preempted in favor of rules adopted by an Agricultural Best Management Practices Committee. The second revisions also designated the Arizona Department of Environmental as the sole entity empowered to enforce the rules adopted by the Ag BMP Committee.

By necessary implication, amendment of a statute that constitutes a SIP element calls for

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<sup>1</sup> The area is more precisely identified as Township 1 North, Range 8 East, Gila & Salt River Base & Meridian, Pinal County, Arizona.

a corresponding revision of the SIP. Moreover, local revision of a SIP provision should be submitted to the EPA within 60 days of adoption. 40 C.F.R. §51.104(d).

Prior to the statutory preemption mentioned above, the county had in place SIP-approved rules that required agricultural sources to exercise "reasonable precautions" to minimize emissions of particulate matter.<sup>2</sup> Those rules applied throughout Pinal County, including that portion of Pinal County that falls within the Phoenix PM-10 Serious Nonattainment Area. The "reasonable precaution" standard applied to an open-ended spectrum of activities, which would include, among other things, an obligation to effect reasonable measures to minimize wind erosion.

Approved SIP elements may be enforced by citizens and by the Administrator. CAA §304(f)(4).

Assuming any forthcoming SIP-approval will implicitly or explicitly include approval of A.R.S. §49-457 (2010), Pinal County objects to any approval of that revised statute as a SIP element affecting Pinal County. That objection rests on three issues.

First, to the extent SIP elements are enforceable by the Administrator and by citizens, a statute that establishes exclusive enforcement authority in a state agency is fundamentally incompatible with citizen- and Administrator-enforceability provisions of Clean Air Act §304.

Second, to the extent the existing BMP program and Pinal County "reasonable precaution" rules already exist as SIP elements, elimination of the enforceability provisions and preemption of the local rules both violate the SIP-modification-prohibition of CAA §110(i).

And third, where existing SIP-approved regulations require reasonable precautions, preempting those regulations and allowing sources to electively choose to mitigate emissions amounts to a relaxation that fails to meet the effectiveness test under CAA §172(c)(8).

Therefore, Pinal County objects to any approval of A.R.S. §49-457 (2010) as a SIP element.

### 3. Proposed Possible Waiver Under Clean Air Act 188(f)

The Phoenix area has implemented a Serious Area PM-10 Plan. This discussion rests on an assumption that adequate BACM measures have been submitted, approved and implemented.

Still, due to on-going exceedances that showed a failure to attain by the serious area attainment date the EPA has also required submission of a "5% Plan."

The EPA has now proposed disapproval of the "5% plan" based on four exceedances at a single monitor. By acclamation, each of those exceedances resulted in substantial part from wind-driven emissions.

The monitor in question sits near the channel of the Salt River, which runs through the heart of Phoenix. That channel occurs lies downstream of the confluence with the Verde River, and drains much of the central region of Arizona. Today, the Salt River normally consists of a wide channel with a narrow ribbon of vegetation supported primarily by discharges from up-stream wastewater treatment facilities. While up-stream dams may contain runoff from most rain- and snowfall-events, releases from major storm events still periodically flood the whole of

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<sup>2</sup> PGCAQCD Reg. 7-3-1.2(E) (1975) provided that "[n]o person shall cause, suffer, allow or permit the performance of agricultural practices including but not limited to tilling of land and application of fertilizers without taking reasonable precautions to prevent particulate matter from becoming airborne." That rule was approved as a SIP element. See 43 FR 53034 (11/15/78). An identical successor provision, PCAQCD Code §4-2-040(C), was similarly approved as a SIP element. See 75 FR 17307 (4/6/2010).

the normally dry channel. To the common knowledge, fluvial channels produce deposits of fine, loose materials, including silt and clay. Again, to the common knowledge, fine, loose materials are highly susceptible to wind erosion.

Much discussion has ensued as to whether the EPA's Exceptional Events Rule should be invoked to exclude those events from the assessment regarding whether the area has attained the PM-10 standard. The focus of that discussion has addressed the characteristics and regional nature of wind events.

As an alternative analysis Pinal respectfully submits that those exceedance events should be examined to determine whether they predominantly result from non-anthropogenic emissions, and thus justify an attainment date waiver under CAA §188(f).

Where on-going exceedances result from non-anthropogenic emissions, and other relevant conditions have been met, the Clean Air Act allows for a waiver of a serious area attainment date. See CAA §188(f).

Regardless of speed, the wind itself is unquestionably non-anthropogenic. On the other hand, wind erosion reflects not merely the wind, but the surface conditions as well.

It is clear that Congress was aware of the effect of surface conditions, and intended a relatively narrow exemption under CAA §188(f).

*[T]he legislative history suggests that Congress contemplated a narrow definition of what may qualify as "nonanthropogenic" and would limit it to activities where the human role in the causation of the pollution is highly attenuated (see generally H.R. Rep. No. 490). "The term 'anthropogenic sources' is intended to include activities that are anthropogenic in origin. An example of such sources is the dry lake beds at Owens and Mono Lakes in California, which give rise to dust storms that are a result of the diversion of water that would otherwise flow to such lakes and should be considered anthropogenic sources" (H.R. Rep No. 490 at 265). 57 FR 13498, 13545 (4/16/92).*

However, the channel of the Salt River contrasts markedly from a drained lake bed.

A drained lake represents an un-natural, man-caused condition of a persisting nature.

On the other hand, in its natural state, much of the channel of the Salt River was covered by dry, erodible material even before the intervention of man.

In the desert southwest, the flow in river channels is largely if not wholly ephemeral in nature. Large weather events or heavy snowfall accumulations can produce runoff events that effectively scour the whole of the channel and leave fluvial deposits that covered much of the natural channel. But given that this area lies on the floor of the Sonoran Desert, seasonal precipitation patterns and periodic droughts have assured that from time immemorial much of the channel of the Salt River channel has been dry.

Long before the inception of this nation, native Americans diverted flows from the Salt River for irrigation purposes. Reaching back more than a millennia, anthropogenic efforts have reduced the flows in the Salt River. See [www.waterhistory.org/histories/hohokam2/](http://www.waterhistory.org/histories/hohokam2/).

Those irrigation efforts were perfected early during the last century, when the Federal Government built a diversion dam that effectively captured modest residual flows into a local irrigation system that largely followed the pattern of historic irrigation canals. Coupled with a series of control dams subsequently built on the Salt and Verde Rivers, flow in the Salt River channel through Phoenix is now largely controlled. See [www.srpnet.com/water/canals/origins.aspx](http://www.srpnet.com/water/canals/origins.aspx).

Draining Owens Lake amounted to a permanent anthropogenic change that exposed material that was highly subject to wind erosion. A water-filled lake never generated PM-10 as a result of wind-erosion. A dry lake bed is always subject to wind erosion. Anthropogenic change

brought about a fundamental change in the character of the area.

In contrast, controlling the Salt River for irrigation purposes may have incrementally altered the susceptibility of the channel to wind erosion. But in a pattern that varied with meteorological and climatological shifts, the channel of the Salt River had always been naturally subject to wind erosion. The perfection of the diversion of the Salt River for irrigation purposes may have increased that susceptibility to wind erosion, but the change was a matter of degree and not of character.

Accordingly, to a greater or lesser extent, the channel of the Salt River may fairly be characterized as a natural, non-anthropogenic source of emissions. When acted upon by the unquestionably non-anthropogenic wind, reasoned conjecture could well conclude that the 2008 violations at the West 43rd Avenue monitor were predominantly nonanthropogenic in nature.

The EPA has the authority to retro-actively rescind a serious area attainment date.

*[S]ubsequent to ... [a serious area] reclassification, the area may later apply for a waiver of the serious area attainment date if it can demonstrate that even after implementing BACM (and after considering the extended attainment and post-attainment provisions of sections 188 and 189 of the Act), nonanthropogenic emissions will prevent the area from attaining the NAAQS. Addendum to the General Preamble for the Implementation of Title I of the Clean Air Act Amendments of 1990, 51 FR 41998, 42006 (8/16/94).*

Also see 58 FR 18190, fn. 3 (4/8/93).

The EPA also has inherent authority to defer at least a moderate area attainment date to allow for an assessment of the relative contribution of anthropogenic versus nonanthropogenic sources. Addendum to the General Preamble, at 42005. Logically, the agency has similar inherent authority with respect to serious area attainment dates.

Therefore, Pinal County submits that the EPA should invoke its inherent authority to at least temporarily suspend the outstanding serious area attainment date, which would also implicitly suspend the need to take the various actions contemplated under the Act for failure to attain by that date. The EPA should correspondingly engage the primarily involved regulatory bodies to undertake an analysis to ascertain whether wind blown emissions emanating from the Salt River channel should be characterized as nonanthropogenic emissions to the extent that a waiver of the serious area attainment date should be granted under §188(f) of the Act.

I appreciate your consideration of these comments.

Sincerely yours,

/dpg/

Donald P. Gabrielson  
Director  
Pinal County Air Quality

enc.

cc w/enc. via e-mail: Colleen McKaughan, EPA Region IX  
Nancy Wrona, ADEQ  
Lindy Bauer, MAG  
Rick Lavis, ACGA



## ARIZONA CHAPTER ASSOCIATED GENERAL CONTRACTORS

1825 West Adams • Phoenix, Arizona 85007 • (602) 252-3926 • Fax (602) 252-5870

October 20, 2010

By E-Mail ([Nudd.Gregory@USEPA.GOV](mailto:Nudd.Gregory@USEPA.GOV)) and Hand Delivery

Gregory Nudd  
U.S. Environmental Protection Agency  
75 Hawthorne Street  
San Francisco, California 94105-3901

Re: EPA-R09-OAR-2010-0715: Comments of Arizona Chapter Associated General Contractors and Industry Vendors and Material Suppliers on Proposed Disapproval of Arizona State Implementation Plan Pertaining to PM-10 in Maricopa County

Dear Mr. Nudd,

Thank you for extending the comment period an additional 8 days in an effort to allow the regions stakeholders an opportunity to comment on this important decision. I am writing on behalf of the Arizona Chapter Associated General Contractors ("AZAGC") its industry vendors and material suppliers with regard to the proposal by the U.S. Environmental Protection Agency ("EPA") to partially approve and disapprove the Arizona State Implementation Plan ("SIP") pertaining to the Maricopa County PM-10 non-attainment area. EPA proposed on September 9, 2010 to partially disapprove the SIP, including a component thereof submitted by the Maricopa Association of Governments ("MAG") that detailed how the County could achieve five percent reductions in PM-10 levels.

AGC is the oldest construction trade association in the state representing over 220 heavy civil contractors, industry vendors and material suppliers approximately 19,000 individuals throughout Arizona since 1934. Some of our members have been "building Arizona" for over 120 years. Currently Arizona's construction industry is experiencing significant economic challenges. Construction has the highest unemployment levels of any industry in Arizona. The recent figures show a 17.1% unemployment rate. Since this economic crisis began the industry has lost over 114,000 jobs, new construction starts are at their lowest level in thirty years.

AGC realizes it is critical for the region to comply with the national ambient air quality standards ("NAAQS"). Our industry is the first to be penalized if the region does not meet attainment. The primary funding source for our members is transportation and infrastructure dollars most of which fall victim to your proposed disapproval determination through a number of sanctions including a "conformity freeze". This action could prevent some transportation projects in the Maricopa region from moving forward ultimately crippling the construction industry already devastated by the current economic climate.

A conformity freeze would be especially unfair to our region considering the number of measures and millions of dollars that our industry has employed to control PM-10 over the last two years. We carried out a very aggressive action plan educating the majority of our workforce on dust control, participating in developing a dust control handbook and field guide, raising our compliance rate and as indicated in the 2008 Maricopa County Air Quality Emissions inventory reducing our emissions from contributing 13% (2005 inventory) to 6%.

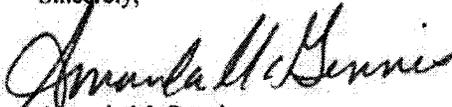
It is an ongoing concern of our industry that EPA rarely recognizes high wind events in Arizona as "exceptional events. The region has been clean at the monitors with the exception of these unusual high wind occurrences that affect primarily the West 43<sup>rd</sup> monitor. To penalize the region for a localized problem is unreasonable, especially when the Exceptional Events Rule ("EER") is perceived as flawed and fourteen western states as well are concerned about the inconsistencies in how it is administered.

October 20, 2010  
Page 2.

In closing AGC, its members and their families all care about the region and the air everyone breathes. As an industry we are committed to complying with the Clean Air Act and will work together with other industry stakeholders and other interested parties to bring the region into attainment. We ask that EPA fully consider the magnitude partially disapproving this plan will have on our industry as well as Arizona. It is our hope you will delay any decision regarding final disapproval action until the Agency has had an opportunity to review all of the scientific data MAG and Arizona Department of Environmental Quality ("ADEQ") have provided regarding high-wind exceptional events and you will reopen the EER and quickly review and propose revisions that will adequately address unique meteorological conditions known to occur not only in Arizona but across the southwest.

AGC appreciates the opportunity to comment and respectfully asks your consideration of these requests.

Sincerely,



Amanda McGennis  
Sr. Vice President

**U.S. Environmental Protection Agency (EPA) Responses to Maricopa Association of Governments (MAG), Maricopa County Air Quality Department, and Arizona Department of Environmental Quality (ADEQ) Questions Regarding a Revised 189(d) Plan for the Maricopa PM-10 Nonattainment Area**

Below we respond to questions posed to EPA by MAG, Maricopa County, and ADEQ in recent emails<sup>1</sup>. Please note that we respond to these questions in the context of an open rulemaking on the Maricopa County (Phoenix) PM-10 Nonattainment Area; Serious Area Plan for Attainment of the 24-Hour PM-10 Standard; Clean Air Act Section 189(d). Therefore, to the extent that these questions implicate that action, we are necessarily circumspect in our responses. Moreover, because most of the questions involve a hypothetical future plan, we may need to revise or expand our responses when more of the technical bases for such a plan have been developed. In other words, while these responses are intended to provide guidance to MAG and ADEQ at this preliminary stage of the development of a replacement plan under CAA section 189(d), they cannot be considered to be exhaustive or immutable.

In reviewing state implementation plan (SIP) submittals, it is EPA's role to approve state choices, provided they meet the requirements of the Clean Air Act (CAA) and applicable regulations. It is the state's responsibility to identify the necessary mix of control measures and programs intended to, among other CAA requirements, achieve timely attainment of air quality standards. As part of this process, the state is also required to hold a public hearing and determine appropriate responses to comments they received prior to submitting the SIP to EPA for action. While EPA can provide input regarding the CAA and EPA regulations and guidance during the SIP development process, we cannot otherwise direct the state to make specific choices or take specific actions.

Maricopa County Air Quality Department submitted two questions. EPA believes that our responses to MAG and ADEQ address Maricopa County's questions as well.

### **MAG Questions**

1. What would be the earliest attainment year acceptable to EPA? What are Jan Taradash's ideas for extending the year of attainment?

**As stated in our proposed action on the 189(d) plan, the current attainment deadline is as expeditiously as practicable, but no later than June 6, 2012. [75 FR 54813-54814]. EPA has the authority under CAA section 172(d)(3) to extend that deadline for up to 5 additional years "considering the severity of nonattainment and the availability and feasibility of pollution control measures." When proposing an expeditious attainment date it is important for the State to consider that there can be no more than three exceedances at any one**

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<sup>1</sup> See email from Lindy Bauer, Maricopa Association of Governments to Colleen McKaughan dated September 21, 2010 with attachments and email from Eric Massey, Arizona Department of Environmental Quality to Colleen McKaughan dated October 1, 2010 with attachments. Responses to two questions in email from Jo Crumbaker, Maricopa County Air Quality Department, dated October 4, 2010, have been incorporated into responses for MAG and ADEQ.

**monitor over a three-year period in order to show attainment. [40 CFR Part 50, Appendix K]. Thus there must be 3 years of clean data prior to the attainment date.**

2. Should we continue to use 2007 emissions as the base year for the five percent per year calculations?

**Assuming you are asking what year the 5% emission reductions must begin, under CAA section 189(d), the annual 5% reductions of PM-10 or PM-10 precursors begin upon the date of submittal of the replacement plan. If the goal is to submit a replacement plan in early 2011, then the reductions need to begin in 2011.**

3. Do any changes need to be made to MCAQD's 2008 Periodic Emissions Inventory for PM-10, June 2010 (2008 PEI)?

**There are three issues that need to be addressed in the 2008 PEI before it is used as the basis for a plan:**

**Vacant land inventory: The vacant land inventory is based on MAG land use data. It is unclear what methodology MAG used to develop this data. These land use assumptions are essential to the accuracy of the windblown dust inventory and therefore to developing a strategy to attain the PM-10 standard on days with elevated winds. Clark County, Nevada has a comprehensive document explaining how their vacant land inventory was developed and verified. A similarly detailed effort would ensure the most accurate possible data for understanding the sources of windblown dust in the Maricopa area.**

**Road dust emissions: EPA has proposed a new method for calculating PM-10 emissions from paved roads.<sup>2</sup> EPA's preliminary analysis indicates that this method results in significantly lower estimates of emissions of PM-10 from travel on paved roads. This new method should be carefully evaluated by Maricopa County Air Quality Department, MAG and ADEQ to determine if it is more representative of conditions in Phoenix than the method used in the 2008 PEI and in the conformity analysis for the recently updated transportation plans. If it is more representative, then it should be used rather than the method currently in AP-42. It is important to note, however that EPA must finalize this method and announce that it is an approved method in the Federal Register before states can use it for conformity purposes.**

**Rule effectiveness calculation methodology: The Maricopa County Air Quality Department has not made the case that it is appropriate to use qualitative factors to estimate rule effectiveness for source categories that have significant compliance data readily available (e.g., earth moving sites, non-metallic mineral sites, vacant lots). The relevant EPA guidance<sup>3</sup> states that these qualitative factors are applicable only when sufficient data on sources is not available. Given the large number of inspections of sources subject to**

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<sup>2</sup> See <http://www.epa.gov/ttnchie1/ap42/ch13/>

<sup>3</sup> "Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations." EPA-454/R-05-001, November 2005.

**MCAQD Rules 310, 310.01 and 316, it appears that sufficient data is available and actual compliance data should be used.**

4. Should the base year emissions be adjusted to be consistent with the 2008 PEI?

**Once the concerns addressed in our response to question #3 above have been addressed, the 2008 PEI should be the basis of the 2011 inventory from which the 5% per year reductions are taken. (Assuming the plan is submitted in early 2011.)**

5. Can we use the same base case design days used in the 2007 Plan when we re-model the new attainment year?

**It would be acceptable to use the same base case design days in the new plan. Instead of developing new base case design days, efforts should be focused on developing an accurate temporally and spatially resolved controlled case for the attainment demonstration.**

6. Can we continue to use AERMOD for modeling attainment in the Salt River Area and rollback for the other attainment demonstrations?

**Yes, but it is important that MAG and Region 9 agree upon a modeling protocol before the modeling begins.**

7. Do we need to show an equivalent of one year's RFP as contingency credit for each year (i.e., 2007 through the attainment year) or can we show this credit only for future years (i.e., 2011 through the attainment year)?

**Assuming you are asking if you need to include contingency measures for past years or future years, it needs to address only future years. The new plan must show reductions in excess of what is needed for the reasonable further progress (RFP) milestone years and attainment year.**

8. Does the modeling domain for the high wind day (i.e., February 15, 2006) need to be expanded?

**It may be appropriate to expand the domain for the high wind day, given that the W. 43<sup>rd</sup> Avenue monitor is relatively close to the current modeling domain boundary and given the land use differences just outside the current domain. This kind of issue should be worked out through discussions with EPA on the modeling protocol.**

9. What milestone years should be assumed in demonstrating RFP?

**See our answer to question #7 and the General Preamble Addendum at 59 FR 42016. The current plan's RFP line starts from 2007, the submittal year, with the only milestone three years later in the attainment year (2010). A similar approach would work for the new plan, although it is possible that additional milestone years will be required in the new plan.**

10. Since there is an EPA-approved BACM analysis in the Serious Area PM-10 Plan, what is the regulatory basis for preconditioning approval of the revised plan on an “analysis of BACM controls in other geographic areas”?

**The statement on p. 54820 of the notice of proposed rulemaking simply recognizes that because the area cannot attain by 2010, additional measures will be needed. The reference to best available control measures (BACM) is common sense—when assessing additional measures, the State should be considering such measures adopted in other nonattainment areas. As stated in our proposed action, we could however effectively “precondition” approval on certain measures as authorized by CAA section 179(d)(2) which provides that, following the failure of an area to attain, the subsequent SIP revision “shall include such additional measures as EPA may reasonably prescribe, including all measures that can be feasibly implemented in the area in light of technological achievability, costs, and any non-air quality and other air quality-related health and environmental impacts.”**

11. The 53 committed control and contingency measures in the 2007 Five Percent Plan address all major sources of PM-10 emissions; what other measures need to be added for the Plan to be approvable?

**Measures may need to be added that ensure the area will expeditiously attain the standard. The determination of new or strengthened measures should be derived from an analysis of the causes of the continuing exceedances and an assessment of feasible controls for the sources responsible.**

12. Will EPA be providing comments on the Supplemental Exceptional Event submissions for the 4 days in 2008 that are currently out for public comment? If the information submitted is found to be acceptable in providing a basis for approving the exemption requests for these days, would it influence any of the 5% Plan disapprovals? How does EPA plan to address the 2009 days flagged as Exceptional Events?

**Yes, EPA will address any information supplied to us as a comment on our proposed action. Even if we were to agree with these four exceptional events claims, there are still significant issues that need to be resolved with the rest of the current 5% Plan.**

**We have not yet received any documentation for the 2009 exceptional event claims.**

13. We are very concerned with the short time period between the September 3, 2010 proposed action and the January 28, 2011 final action. What showing would the State of Arizona have to make to extend the current January 28, 2011 deadline?

**Response will be provided next week.**

14. On May 25, 2010, EPA prepared a document, Phoenix PM-10 Plan: Transportation Conformity Implications and Timelines. In our description of the conformity freeze, EPA indicated that “The MVEB submitted in the new 5% plan should be consistent with both the RFP and attainment demonstrations. Note that EPA can act on the RFP budgets separately from the attainment budgets if the attainment target set in the plan is deemed adequate. If the State can develop an

RFP plan that meets EPA requirements, this approach allows for transportation planning to continue while EPA and the State work to resolve concerns about the attainment demonstration.” Please describe how this would work and what it would mean. What is the earliest point in the process that EPA could find a new budget adequate and lift the conformity freeze?

**Response will be provided next week.**

15. When MAG submits a revised Five Percent Plan with a new conformity budget, would EPA be able to issue an adequacy finding within 90 days or would the conformity budget have to be approved as part of the Plan approval?

**When Arizona submits a revised 5% plan, EPA will review the submitted MVEB to see if it is consistent with the requirements of the Clean Air Act. If it is consistent, EPA will propose to find it adequate. This process typically takes between 90 and 120 days.**

16. How long will it take EPA to take action on the revised Five Percent Plan after it is submitted?

**Response will be provided next week.**

17. Does the 5% PM-10 annual emission reduction requirement extend indefinitely until there are three years of ambient measurements without a violation of the PM-10 NAAQS?

**Yes. Section 189(d) of the Clean Air Act requires 5% reductions in PM-10 or PM-10 precursors from the date of plan submission until the standard is attained.**

## **ADEQ Questions**

### **GENERAL**

1. Is this Serious Area eligible for a 5-year extension for the attainment deadline pursuant to Clean Air Act Sections 172(a)(2) “considering the severity of nonattainment and the availability and feasibility of pollution control measures,” and 188(e) due to “the nature and extent of nonattainment, the types and numbers of sources or other emitting activities in the area (including the influence of uncontrollable natural sources...) and the technological and economic feasibility of various control measures”?

**See the response to MAG question number 1 for response with respect to Section 172 (a)(2). We do not believe any additional extensions are permissible under 188(e).**

2. What is the first milestone year by which RFP should be demonstrated as required by Section 110(c): 3 years after 2007? Or the third year of control measures required by the Revised Plan?

**See the response to MAG question number 9.**

3. If EPA were to prescribe other control measures pursuant to CAA Section 179(d)(2) what would EPA prescribe to ensure the Plan is approvable?

See response MAG question number 10.

4. Would the Emissions Budget for all source categories have to be completed in order for EPA to make an adequacy finding for the Motor Vehicle Emissions Budget (MVEB)?

**The budgets must meet all of the adequacy criteria contained in the conformity rule. (40 CFR 93.118(e)(4)). In order to meet 40 CFR 93.118(e)(4)(iv) the plan must address all emission categories. In addition, the EPA must ensure that the MVEB is consistent with the attainment, RFP and 5% reduction demonstrations.**

5. Does EPA have examples of descriptions used by other jurisdictions to demonstrate the State's ability to implement enforcement of the statutory provisions that EPA identified in the partial approval/disapproval? EPA specifically identified A.R.S. §§ 49-457 (Agricultural Best Management Practices [Ag BMP] program), -457.01 (Leaf blower restriction/training), -457.03 (Off-road vehicles) and -457.04 (Off-highway vehicle [OHV] and all-terrain vehicle dealers, etc.).

**States and responsible local agencies must demonstrate that they have the legal authority to adopt and enforce provisions of the SIP and to obtain information necessary to determine compliance. SIPs must also describe the resources that are available or will be available to the state and local agencies to carry out the plan, both at the time of submittal and during the 5-year period following submittal. The 189(d) plan submitted by MAG and ADEQ in 2007 does a good job of identifying the legal authority for the entities responsible for implementing control measures. The plan also does a good job describing the resources available to carry out some of the control measures. For example, measures implemented by local jurisdictions typically include a section entitled "Level of Personnel and Funding Allocated for Implementation". This type of information should be provided for all control measures.**

#### **AGRICULTURAL BEST MANAGEMENT PRACTICES**

6. In an April 14, 2010, letter to the Agricultural Best Management Practices (Ag BMP) Committee Chairman Dan Thelander, EPA recommended that the Ag BMP Committee continue considering modifications to the "cropland" BMP category. Can EPA specify if it was referring to land leveling, transplanting and the shuttle system as additional BMPs? Alternatively, was EPA pointing out that that all of the current BMPs need re-examination to ensure that there is sufficient specificity for the purposes of enforceability and that the measures are implemented at a BACM level?

**Our April 14, 2010 letter advised the Ag BMP Committee "to continue considering modifications to the portions of the Maricopa BMP Rule that apply to cropland." Our intent was to broadly refer to all the existing requirements in the rule that apply to cropland and areas associated with cropland. We advised the Committee to consider modifications to existing requirements since, as stated in the April 14, 2010 letter, "several other areas have developed rules to control PM10 from agricultural sources since the Environmental Protection Agency (EPA) approved Maricopa's BMP program as meeting**

**the Federal Clean Air Act (CAA) requirements for Best Available Control Measures (BACM) in 2002." As we stated in our proposed action, the other agencies that have adopted these controls, as well as EPA, have acquired additional expertise about how to control emissions from these sources and implement regulations for them. As a result, we no longer believe that the requirements in the rule that we approved in 2002 for the Maricopa area fully meet CAA requirements [75 FR 54812 – 54813].**

7. Are there particular definitions in Arizona Administrative Code R18-2-610 that EPA expects the Ag BMP Committee to review for specificity? Is there EPA guidance available regarding what level of specificity is acceptable?

**Comparable programs in other areas such as the San Joaquin Valley have provided more specificity to meet CAA requirements through an application submittal and approval process (see 75 FR 54813, footnote 15). Once we finalize our action, we would like to work with the Ag BMP Committee, ADEQ, USDA, and all interested stakeholders to further refine what level of specificity is needed to meet CAA requirements and how the BMP program can be revised accordingly.**

8. Is EPA open to alternatives to an “application submittal and approval process” for implementing the BMPs or would EPA consider a “notice and go” approach that could be less resource intensive for ADEQ? Would adding specificity and enforceability to the existing program (where appropriate) resolve EPA’s concerns?

**We understand that ADEQ has limited resources, and will work with the Ag BMP Committee, ADEQ, USDA, and all interested stakeholders to develop an approach that will satisfy CAA requirements while addressing that concern. Once we finalize our action, we would like to have more specific discussions about how the Ag BMP Committee can address EPA’s concerns.**

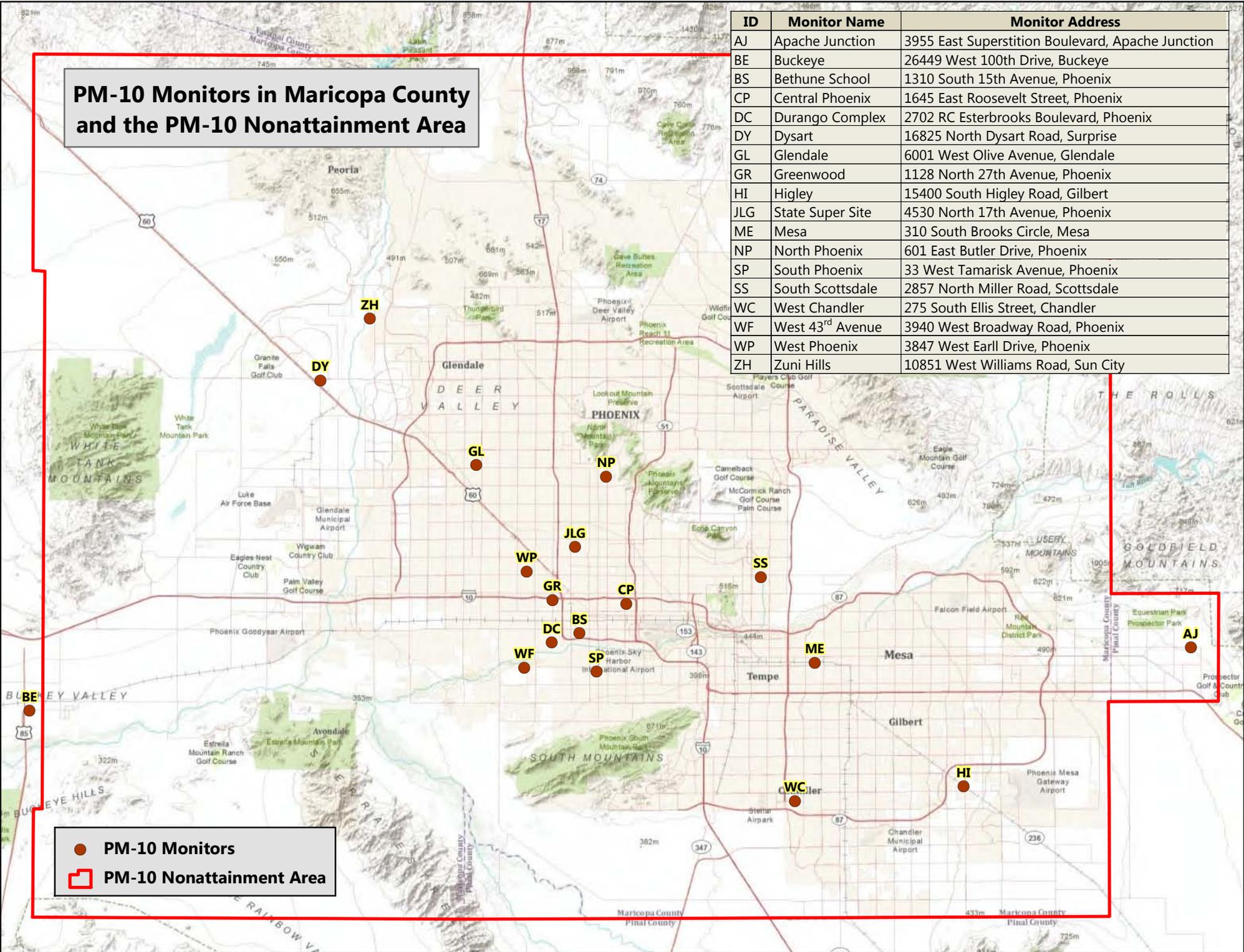
9. What guidance does EPA have for the Ag BMP Committee on how confidential agricultural business information can be protected while providing the greater level of specificity and as it relates to the application process?

**The regulations governing EPA’s treatment of confidential business information are in 40 C.F.R. Part 2, Subpart B.**

## PM-10 Monitors in Maricopa County and the PM-10 Nonattainment Area

ID	Monitor Name	Monitor Address
AJ	Apache Junction	3955 East Superstition Boulevard, Apache Junction
BE	Buckeye	26449 West 100th Drive, Buckeye
BS	Bethune School	1310 South 15th Avenue, Phoenix
CP	Central Phoenix	1645 East Roosevelt Street, Phoenix
DC	Durango Complex	2702 RC Esterbrooks Boulevard, Phoenix
DY	Dysart	16825 North Dysart Road, Surprise
GL	Glendale	6001 West Olive Avenue, Glendale
GR	Greenwood	1128 North 27th Avenue, Phoenix
HI	Higley	15400 South Higley Road, Gilbert
JLG	State Super Site	4530 North 17th Avenue, Phoenix
ME	Mesa	310 South Brooks Circle, Mesa
NP	North Phoenix	601 East Butler Drive, Phoenix
SP	South Phoenix	33 West Tamarisk Avenue, Phoenix
SS	South Scottsdale	2857 North Miller Road, Scottsdale
WC	West Chandler	275 South Ellis Street, Chandler
WF	West 43rd Avenue	3940 West Broadway Road, Phoenix
WP	West Phoenix	3847 West Earll Drive, Phoenix
ZH	Zuni Hills	10851 West Williams Road, Sun City

- PM-10 Monitors
- PM-10 Nonattainment Area





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON D.C. 20460

OFFICE OF THE ADMINISTRATOR  
SCIENCE ADVISORY BOARD

September 10, 2010

EPA-CASAC-10-015

The Honorable Lisa P. Jackson  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20460

Subject: CASAC Review of *Policy Assessment for the Review of the PM NAAQS – Second External Review Draft* (June 2010)

Dear Administrator Jackson:

The Clean Air Scientific Advisory Committee (CASAC) Particulate Matter (PM) Review Panel met on July 26 – 27, 2010 and on August 25, 2010 in a public teleconference to review the *Policy Assessment for the Review of the PM NAAQS - Second External Review Draft* (June 2010). This letter highlights CASAC's main comments on this document, followed by consensus responses to the charge questions and comments of individual Panel members.

This review of the *Second Draft Policy Assessment* completes the first cycle through the revised suite of NAAQS review documents and thus represents a major milestone. CASAC commends EPA staff for developing an ordered and transparent basis for decision-making throughout the NAAQS review process from the *Integrated Science Assessment* (ISA) to the *Quantitative Health Risk Assessment* and *Urban Focused Visibility Assessment* and then to the *Policy Assessment*. The *Second Draft Policy Assessment* was notably responsive to CASAC's comments on the first draft. At CASAC's request, the current draft sets out the underlying decision-making algorithms, greatly enhancing the transparency and readability of the document. EPA's approach to reviewing the standard is explicitly articulated throughout the document, as are the key decision-making points and the evidence considered. CASAC's major concerns, as expressed in our letter of May 17, 2010, have been addressed. EPA staff are to be congratulated for building on CASAC's suggestions and developing an assessment that provides a scientifically sound basis for making decisions on the primary and secondary PM standards.

***Primary Standards for Fine Particles***

CASAC supports the EPA staff's conclusion in the *Second Draft Policy Assessment* that "currently available information clearly calls into question the adequacy of the current standards". For PM<sub>2.5</sub>, the current 24-hour primary standard is 35 µg/m<sup>3</sup> and the annual standard is 15 µg/m<sup>3</sup>. EPA staff also conclude that consideration should be given to alternative annual PM<sub>2.5</sub> standard levels in the range of 13 – 11 µg/m<sup>3</sup>, in conjunction with retaining the current 24-hour PM<sub>2.5</sub>

standard level of  $35 \mu\text{g}/\text{m}^3$ , and that consideration could also be given to an alternative 24-hour  $\text{PM}_{2.5}$  standard level of  $30 \mu\text{g}/\text{m}^3$  in conjunction with an annual standard level of  $11 \mu\text{g}/\text{m}^3$ . CASAC concludes that the levels under consideration are supported by the epidemiological and toxicological evidence, as well as by the risk and air quality information compiled in the *Integrated Science Assessment* (December 2009), *Quantitative Health Risk Assessment for Particulate Matter* (June 2010) and summarized in the *Second Draft Policy Assessment*. Although there is increasing uncertainty at lower levels, there is no evidence of a threshold (i.e., a level below which there is no risk for adverse health effects). In addition, these combinations of annual/daily levels may not be adequately inclusive. It was not clear why, for example, a daily standard of  $30 \mu\text{g}/\text{m}^3$  should only be considered in combination with an annual level of  $11 \mu\text{g}/\text{m}^3$ . The rationale for the 24-hour/annual combinations proposed for the Administrator's consideration (and the exclusion of other combinations within the ranges contemplated) should be more clearly explained.

### ***Primary Standard for Thoracic Coarse Particles***

CASAC recommends that the primary standard for  $\text{PM}_{10}$  should be revised downwards. While current evidence is limited, it is sufficient to call into question the level of protection afforded by the current standard (a 24-hour standard of  $150 \mu\text{g}/\text{m}^3$ ).

CASAC supports the EPA staff conclusion that it is appropriate to change the  $\text{PM}_{10}$  standard to a 98<sup>th</sup> percentile form because of its higher rate of identifying areas in nonattainment while reducing the rate of misclassification. We do not agree that the available scientific evidence strongly supports the proposed upper bound standard level of  $85 \mu\text{g}/\text{m}^3$ . The *Second Draft Policy Assessment* demonstrates that a 98<sup>th</sup> percentile level of  $85 \mu\text{g}/\text{m}^3$  would be less stringent as compared to the current standard, protecting a smaller fraction of the population. In fact, on a population basis, results in the *Second Draft Policy Assessment* demonstrate that a 98<sup>th</sup> percentile level between  $75$  and  $80 \mu\text{g}/\text{m}^3$  is comparable in the degree of protection afforded to the current  $\text{PM}_{10}$  standard. The change in form will lead to changes in levels of stringency across the country, a topic needing further exploration. While recognizing scientific uncertainties, CASAC supports a lower level to provide enhanced protection, somewhere in the range of  $75 - 65 \mu\text{g}/\text{m}^3$ . We recognize that the Administrator will need to apply the Clean Air Act's requirement for a "margin of safety" in a context of uncertainty with respect to the health effects of thoracic coarse particles.

The *Second Draft Policy Assessment* concludes that  $\text{PM}_{10}$  should continue to be the indicator for thoracic coarse particles. While it would be preferable to use an indicator that reflects the coarse PM directly linked to health risks ( $\text{PM}_{10-2.5}$ ), CASAC recognizes that there is not yet sufficient data to permit a change in the indicator from  $\text{PM}_{10}$  to one that directly measures thoracic coarse particles. To improve EPA's scientific basis for the next NAAQS review, we recommend the deployment of a network of  $\text{PM}_{10-2.5}$  sampling systems so that future studies will be able to expand the evidence base on this indicator and facilitate assessment of whether  $\text{PM}_{10-2.5}$  should be used as an appropriate indicator for thoracic coarse particles. In concluding this letter, we elaborate further on the urgency of research on certain aspects of PM and health.

### ***Secondary Standard for PM-Related Visibility Impairment***

CASAC supports the EPA staff conclusion that “currently available information clearly calls into question the adequacy of the current standards and that consideration should be given to revising the suite of standards to provide increased public welfare protection.” The current secondary standards are identical to the current primary standards for fine and thoracic coarse particles. The detailed estimates of hourly PM light extinction under current conditions (and for assumed scenarios of meeting current standards) clearly demonstrate that current standards do not protect against levels of visual air quality which have been judged to be unacceptable in all of the available urban visibility preference studies. EPA staff’s approach for translating and presenting the technical evidence and assessment results is logically conceived and clearly presented. The 20-30 deciview range of levels chosen by EPA staff as “Candidate Protection Levels” is adequately supported by the evidence presented.

While the evidence shows that the current standard does not adequately protect visibility, the choice of indicator for such protection was a subject of considerable discussion among CASAC panelists. The *Second Draft Policy Assessment* discusses three potential indicators: a PM<sub>2.5</sub> Mass Indicator, a Speciated PM<sub>2.5</sub> Mass-calculated Light Extinction Indicator, and a Directly Measured PM<sub>2.5</sub> Light Extinction Indicator. Overwhelmingly, CASAC would prefer the direct measurement of light extinction, the property of the atmosphere that most directly relates to visibility effects. It has the advantage of relating directly to the demonstrated harmful welfare effect of ambient PM on human visual perception. However, in discussing the Directly Measured PM<sub>2.5</sub> Light Extinction Indicator with EPA staff, we learned that the time required to develop an official Federal Reference Method (FRM) for this indicator would postpone its implementation for years. Given the time lag associated with implementing the Directly Measured Indicator, CASAC agrees with EPA staff’s preference for a Speciated PM<sub>2.5</sub> Mass-calculated Light Extinction Indicator. Its reliance on procedures that have already been implemented in the Chemical Speciation Network (CSN) and routinely collected continuous PM<sub>2.5</sub> data suggest that it could be implemented much sooner than a directly measured indicator.

### ***Areas for Future Research***

The *Second Draft Policy Assessment* has identified scientific issues that will need to be addressed in order to improve EPA’s scientific basis for promulgating PM standards in the future. As stated in our letter of May 17, 2010, CASAC urges the Agency to reinvigorate research that might lead to new indicators that may be more directly linked to the health and welfare effects associated with ambient concentrations of PM. CASAC also suggests the ongoing collection of more comprehensive PM monitoring data, including expanding the range of sizes to provide information in the ultrafine particle range, and adding measurements of numbers, chemistry, species, and related emissions characteristics of particles. CASAC strongly urges EPA to pursue research to develop a Federal Reference Method for a Directly Measured PM<sub>2.5</sub> Light Extinction Indicator and to develop baseline light extinction data so that it will be available for the next 5 year review cycle. CASAC is available to provide advice on priorities for PM-related research.

Thank you for the opportunity to comment on the *Second Draft Policy Assessment*. We look forward to receiving your response.

Sincerely,

*/Signed/*

Dr. Jonathan M. Samet, Chair  
Clean Air Scientific Advisory Committee

## NOTICE

This report has been written as part of the activities of the EPA's Clean Air Scientific Advisory Committee (CASAC), a federal advisory committee independently chartered to provide extramural scientific information and advice to the Administrator and other officials of the EPA. CASAC provides balanced, expert assessment of scientific matters related to issues and problems facing the Agency. This report has not been reviewed for approval by the Agency and, hence, the contents of this report do not necessarily represent the views and policies of the EPA, nor of other agencies within the Executive Branch of the federal government. In addition, any mention of trade names or commercial products does not constitute a recommendation for use. CASAC reports are posted on the EPA Web site at: <http://www.epa.gov/casac>.

**Clean Air Scientific Advisory Committee  
Particulate Matter Review Panel**

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Dr. Holly Stallworth, Designated Federal Officer, EPA Science Advisory Board Staff Office

## **CASAC Responses to Charge Questions on the *Second Draft Policy Assessment* for the Review of the Particulate Matter NAAQS**

### **Primary Standards for Fine Particles**

#### **1. Current Approach (Section 2.1.3):**

- a. What are CASAC's views on the staff's approach to translating the available epidemiological evidence, risk information, and air quality information into the basis for reaching conclusions on the adequacy of the current standards and on alternative standards for consideration?**

CASAC agrees with the approach as described in Section 2.1.3 and appreciates the clarity with which the approach is detailed. The overview of the approach presented in Figure 2-1 is well-organized, logical, and clear. CASAC agrees that it is appropriate to return to the strategy used in 1997 that considers the annual and the short-term standards together, with the annual standard as the controlling standard, and the short-term standard supplementing the protection afforded by the annual standard. CASAC commends the expansion of the discussion on evidence of risk across life stages as well as of specific susceptibility risk factors and the use of empirical evidence and risk assessment findings together. CASAC considers it appropriate to place the greatest emphasis on health effects judged to be causal or likely causal in the analysis presented in the ISA. Finally, the statement that the data "call into question" the adequacy of the current standard could be more forcefully stated by concluding that the current standard is not protective.

- b. Has staff appropriately applied this approach in reviewing the adequacy of the current standards (Section 2.2) and potential alternative standards (Section 2.3)?**

The staff has carefully followed this approach in reviewing the adequacy of the current standards and in considering potential alternative standards. The outline of the text of Section 2.3 follows the outline presented in the overview of the approach given in Figure 2-1.

#### **2. Form of the Annual Standard (Section 2.3.3.1):**

- a. What are CASAC's views on the additional analyses conducted to characterize the potential for disproportionate impacts on susceptible populations, including low income groups and minorities associated with spatial averaging allowed by the current annual standard?**
- b. In light of these analyses, what are CASAC's views on staff's conclusion that the form of the annual standard should be revised to eliminate spatial averaging?**

CASAC found the additional analyses provided in the 2<sup>nd</sup> draft PA to be helpful in understanding how spatial averaging differs relative to the highest average value from a single community site. This latter approach helps to ensure adequate protection of populations living in lower socioeconomic areas and contributes an additional margin of safety for other populations. Although much of the epidemiological research has been conducted using community-wide averages, several key studies reference the nearest measurement site, so that some risk estimates are not necessarily biased by the averaging process. Further, the number of such studies is likely to

expand in the future. CASAC concludes that it is reasonable for EPA to eliminate the spatial averaging in the new PM<sub>2.5</sub> annual average standard.

**3. Alternative Levels (Section 2.3.4): What are CASAC's views on the following:**

**a. The insights that can be gained into potential alternative standard levels by considering:**

**i. Confidence bounds on concentration-response relationships?**

CASAC commends the progress made in attempting to use confidence bounds in considering alternative levels of the standard, but also finds unresolved complexities. First, staff apparently made a comprehensive effort to identify relevant studies for which bounds were reported on concentration-response (C-R) relationships; this should be explicitly stated. Second, the statement made in reference to what these bounds do not indicate ("these analyses do not provide evidence of a concentration below which the confidence interval becomes notably wider and uncertainty in a C-R relationship substantially increases" [p.2-57]) is contradictory to what they, in fact, do indicate. The confidence bounds widen at lower concentrations because there are fewer data at such concentrations, as acknowledged by staff. This widening is of interest in characterizing precision of estimates as one source of uncertainty. Third, CASAC does not agree with the conclusion that these bounds cannot be used in considering alternative levels of the PM NAAQS, even with the limited C-R functions shown. EPA Staff should be encouraged to integrate the information available on relevant C-R confidence bounds with that on study concentration distributions in arriving at a range of levels for consideration.

For the future, findings of epidemiological studies might be used in several ways in considering a range of levels for a NAAQS. It would be preferable to have information on the concentrations that were most influential in generating the health effect estimates in individual studies. Less ideal, but still useful, would be information on the distribution of concentrations experienced by participants in the studies. For time-series studies, because of the similar number of events (e.g., deaths) per day, this is likely to be the same as the PM concentration distribution; the situation is more complex for cohort studies in which exposures of individuals change over time. Least preferable is using PM concentration distribution metrics, such as those used by EPA Staff in arriving at a range of levels for consideration. An attempt should be made, to the extent possible, to integrate this latter approach with aspects of the first two approaches, realizing that the reported study findings and data needed to accomplish this goal may not be readily available, and that interactions with investigators may be needed.

**ii. Different statistical metrics that characterize air quality distributions from multi-city epidemiological studies?**

The *Second Draft Policy Assessment* provides two alternatives, referred to as the composite monitor and the maximum monitor. On the top of page 2-61, the text appears to be stating that, for the same air quality domain, the composite monitor concentrations are less than those based on the maximum monitor approach, and an argument is made that an approach based on composite monitors has a "margin of safety" compared to the maximum monitor perspective. However, a judgment is made that data should be selected from the epidemiological studies for which the C-R relationships are "strongest," and that concentrations not more than one standard deviation below

the long-term mean concentration should be used. The judgment, while not unreasonable, is not explained.

It is not clear why the lower bound to be considered is a range from the 10<sup>th</sup> to 25<sup>th</sup> percentiles, as opposed to, say, the 10<sup>th</sup> percentile alone. In Figure 2-7, for long-term exposure studies, in the upper panel, the 10<sup>th</sup> percentile annual mean concentrations range from approximately 9 to 11  $\mu\text{g}/\text{m}^3$ . The population-weighted values are 10 to 13  $\mu\text{g}/\text{m}^3$ . In both cases, the upper bounds of these ranges are for the high site, and the lower bounds are for the composite monitor.

In summary, this section of the report lacks clarity and focus on the key consideration of identifying ambient concentrations at which adverse effects are observed, in anticipation of supporting a range of concentrations that take into account the statutory mandate to provide an adequate margin of safety.

**b. Potential alternative annual standard levels based on composite monitor distributions versus maximum monitor distributions?**

The composite monitor approach is preferable because of its stability, and for the additional margin of safety it provides. The NAAQS should provide health protection for both long-term and short-term health effects. It is not clear, for example, as to why the 24-hour level should be at least 2.5 times higher than the annual standard. Such a statement seems to be independent of consideration of health effects. A statement is made on page 2-73, lines 26-27 that “based on this consideration” consideration should be given to retaining the 35  $\mu\text{g}/\text{m}^3$  24-hr level in conjunction with annual standards of 13 to 11  $\mu\text{g}/\text{m}^3$ . Setting aside the math problem here (e.g.,  $11 \times 2.5 = 27.5$ , not 35), the rationale for the 2.5 times factor appears arbitrary and not based on health considerations.

**c. Use of risk information in informing staff conclusions on alternative annual and 24-hour standard levels, including approaches used to assess overall confidence and potential bias in the risk estimates?**

The risk information provides valuable insights, and should be used in drawing conclusions. However, there is not symmetry between the evidence-based section and the risk-based section. The “evidence-based” section reaches the conclusion that alternative levels to be considered should be 11 to 13  $\mu\text{g}/\text{m}^3$  for the annual standard and 35  $\mu\text{g}/\text{m}^3$  for the 24-hour standard, and also a combination of 11/30  $\mu\text{g}/\text{m}^3$  for the annual/24-hour levels. However, the risk-based analysis does not systematically evaluate these combinations, omitting the 11/35  $\mu\text{g}/\text{m}^3$  and 11/30  $\mu\text{g}/\text{m}^3$  combinations. Furthermore, the text implies that a 10/35  $\mu\text{g}/\text{m}^3$  case was analyzed, but no results were reported. This difference between the ranges from the two sections reflects in part the scenarios considered in the risk assessment. While the Administrator’s consideration should not be limited to those combinations that were analyzed quantitatively, the final policy assessment should be systematic and emphatic about providing conclusions regarding combinations of annual and daily levels that were not analyzed quantitatively but that are recommended for consideration.

The results of the risk assessments are presented mainly in terms of percentage risk reduction compared to the current standard, in Figures 2-11 and 2-12 for long-term and short-term effects, respectively. While this is useful information, it is not directly relevant to the setting of a NAAQS,

given the goal of a NAAQS--to protect public health with an adequate margin of safety. Additionally, the information on risk reduction might be better presented as the absolute numbers of deaths avoided rather than the percentage reduction under the various scenarios. The text should be rewritten to better reflect the utility and relevance of the information on reduction of disease burden for determining the NAAQS.

This section should not only focus on the best estimate of risk, but the confidence intervals and non-quantified sources of bias, such as the role of socio-economic status (SES). See also Page 2-35, lines 10-12, which indicates that sensitivity analysis of model specification used in the risk assessment produce risk estimates that are a factor of 2 to 3 higher than the core risk estimates.

**d. Staff's conclusion that alternative annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$  are most strongly supported by the available evidence and risk-based information?**

The rationale for the conclusion was well developed, but could use further justification, particularly in regard to the pairing of the 24-hour and annual standards. The risk assessment did not explore all the combinations considered in the *Policy Assessment*. While CASAC agrees with the range of 13 to 11  $\mu\text{g}/\text{m}^3$ , it finds less justification for the pairings proposed.

**e. Staff's approach of focusing on peak-to-mean ratios to inform the level of a 24-hour standard that would provide supplemental protection to a generally controlling annual standard?**

The peak-to-mean ratio merits consideration in providing insight as to whether the annual or 24-hour standard would be controlling in a particular area. It is not relevant to informing the actual level to be selected for the 24-hour standard.

**f. Staff's conclusion that consideration should be given to retaining the current 24-hour standard level of 35  $\mu\text{g}/\text{m}^3$  in conjunction with annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$ , and that consideration could also be given to an alternative 24-hour standard level of 30  $\mu\text{g}/\text{m}^3$  particularly in conjunction with an annual standard level of 11  $\mu\text{g}/\text{m}^3$ ?**

The conclusions are reasonable in relation to the criteria established by the Clean Air Act (CAA), and those developed by the OAQPS Staff that have been endorsed by CASAC. The choices within these options will need to be based on the Administrator's interpretation of the CAA's requirement for an adequate margin-of-safety. In other words, in the absence of thresholds in the dose-response relationships for the health outcomes of concern, how much public health impact resulting from exposure to ambient air  $\text{PM}_{2.5}$  is acceptable under the CAA.

The least protective option (35-13  $\mu\text{g}/\text{m}^3$ ) would provide significant additional public health benefits in most of the U.S., in comparison to the current limits (35-15  $\mu\text{g}/\text{m}^3$ ). The most protective option (30-11  $\mu\text{g}/\text{m}^3$ ) would provide significant additional public health benefits to a larger part of the U.S. population in comparison to the current limits (35-15  $\mu\text{g}/\text{m}^3$ ) and any of the intermediate options, but would not prevent at least some adverse health effects among the most susceptible

segments of the population, given our current understanding of dose-response relationships.

**4. Key Uncertainties and Areas for Future Research and Data Collection (Section 2.5):**

**What are CASAC's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?**

The key uncertainties and areas for future research and data collection are well summarized in Section 2.5. The acknowledgement (at the top of page 2-87) that "Much of this research may depend on the availability of increased monitoring data" is apt and appreciated. The opportunities for epidemiological research to effectively address the knowledge gaps on the effects, and concentration-response relationships, of PM components and source-related mixtures cannot be achieved without additional monitoring data to provide PM speciation and better temporal and spatial resolution. Only the EPA can provide the impetus and support for such an enhancement in air quality monitoring.

The research needs to address uncertainties in health outcomes, exposure durations of concern, and susceptible populations that are also very nicely outlined are well targeted, and can be effectively studied in human populations. Such studies, to be most productive, will need the enhanced monitoring data, as recognized by EPA staff.

This section, as written, has more to do with future research priorities than with uncertainties that influence impending decisions on revisions to the PM<sub>2.5</sub> NAAQS. The section outlines a very broad and ambitious research agenda. It would help to begin this section with a prioritized review of key uncertainties in order to help establish priorities among the suggested research topics. Obviously the key uncertainty is the range of concentrations that are causing the observed health effects in the epidemiological studies, and the degree of certainty in effects at the lower concentrations along the C-R relationship. This uncertainty has necessitated using the distributional measures of concentrations from the epidemiology studies in attempting to make the link between the epidemiological findings and consideration of alternative concentrations for the PM NAAQS. While this uncertainty is reflected in two (p.2-88 and 2-90) of the many recommendations for future research that C-R functions include confidence bounds, this uncertainty should be highlighted. We urge careful attention to priorities in relation to future revisions of the PM NAAQS, rather than a lengthy list of research topics.

CASAC finds the list to be appropriate, but also suggests consideration of the following:

- Generating time-activity data to support probabilistic scenario-based exposure models, such as additional activity diary data to incorporate into the Consolidated Human Activity Database (CHAD).
- Characterizing indoor exposures to PM of ambient origin. For example, the penetration of ambient PM<sub>2.5</sub> and PM<sub>10</sub> into indoor microenvironments (home, work, school, restaurant, bar, vehicle) should be better characterized, particularly taking into account differences in penetration with respect to particle size and composition. Given the greater amount of time we spend in indoor vs. outdoor environments, the need for these data is compelling.

- Addressing the bidirectional linkages between climate change and concentration, size distribution and composition of PM in the PM<sub>10</sub>, PM<sub>2.5</sub>, and ultrafine particle (UFP) fractions. This would include assessing the relative effects of climate cooling due to aerosols (e.g., sulfate) vs. climate warming due to elemental carbon. Effects of increased wildfires, windblown dust and pollen seasonality are also of interest.
- Continuing support of toxicological research in terms of chemical components, sources and subfractions (to include UFP). Toxicological studies will address biological plausibility and give insights as to possible mechanisms. Although C-R relationships are a challenge to extrapolate from animal to human, animal studies do provide an effective means to conduct controlled and well-characterized exposure scenarios to examine C-R relationships.

**Primary Standard for Coarse Particles**

**5. Current Approach (sections 3.1.4, 3.2, 3.3):**

- a. What are CASAC’s views on the approach to translating the available evidence and air quality information into the basis for reviewing the coarse particle standard?**

CASAC finds the second draft superior to the first draft reviewed earlier; it demonstrates considerable progress and responsiveness to CASAC's suggestions. The document is grounded on explicit data and clearly stated arguments. EPA staff has done its best to take the available evidence relating to exposure and health effects and to use them as the basis for reviewing the coarse particle standard.

There are inherent deficiencies which persist because of lack of data. Concentrations of the coarse particle fraction—particles between 2.5 and 10 microns—are usually estimated by subtraction and not measured directly. Moreover, given the limited data on coarse particles, much of the evidence on health effects comes from interpreting studies using PM<sub>10</sub> and assessing the extent to which the health effects observed relate to the entire size range collected [including PM<sub>2.5</sub>] or to only the coarse particle fraction.

- b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 3.2) and potential alternative standards (section 3.3)?**

CASAC responds affirmatively to this question. The staff have noted the limitations of the data and used them in light of these limitations to address the question of whether current standards are adequate. CASAC also finds that staff has adequately discussed alternative standards and the consequences of applying them.

*In toto*, Chapter 3 reads well and is much improved. EPA staff has done its best to describe an evidence-based approach for applying the limited amount of health effects evidence and air quality information in different US regions as a basis for reviewing the adequacy of the current coarse particle standard.

**6. Adequacy of the Current PM<sub>10</sub> Standard (section 3.2): What are CASAC's views on the alternative approaches presented for considering the evidence and its uncertainties as they relate to the adequacy of the current standard?**

The general consensus of CASAC is that consideration should be given to revising the current 24-hour PM<sub>10</sub> standard. The rationale for this recommendation emerges from the judgment that the current data, while limited, is sufficient to call into question the level of protection afforded the American people by the current standard. The opinion hinges on the strength of associations in multi-city studies and positive trends in single city studies linking PM<sub>10</sub> exposure and health endpoints, and moreover that these health effects can occur below the current standard. This approach gives significant weight to studies that have generally reported that PM<sub>10-2.5</sub> effect estimates remain positive when evaluated in co-pollutant models. Likewise controlled human exposure PM<sub>10-2.5</sub> studies showing decreases in heart rate variability and increases in markers of pulmonary inflammation are deemed adequate to support the plausibility of the associations reported in epidemiologic studies.

**7. Indicator (Section 3.3.1): What are CASAC's views on the approach taken to considering standard indicator and on staff's conclusion that PM<sub>10</sub> remains an appropriate indicator in this review?**

The majority of CASAC determined that there was insufficient evidence currently available to support a change in the indicator from PM<sub>10</sub> to PM<sub>10-2.5</sub>. However, CASAC vigorously recommends the implementation of plans for the deployment of a network of PM<sub>10-2.5</sub> sampling systems so that future epidemiological studies will be able to more thoroughly explore the use of PM<sub>10-2.5</sub> as a more appropriate indicator for thoracic coarse particles.

If a PM<sub>10</sub> indicator is retained, the Agency should consider limiting the Federal Reference Method to include only low volume PM<sub>10</sub> samplers, as high volume PM<sub>10</sub> samplers do not produce comparable results.

**8. Form (Section 3.3.3): What are CASAC's views on the approach taken to considering the form of the standard and on staff's conclusion that revising the form to a 98<sup>th</sup> percentile form would be appropriate for a 24-hour PM<sub>10</sub> standard meant to protect against exposures to thoracic coarse particles?**

CASAC felt strongly that it is appropriate to change the statistical form of the PM<sub>10</sub> standard to a 98<sup>th</sup> percentile form. Published work has shown that the percentile form has greater power to identify non-attainment and a smaller probability of misclassification relative to the expected exceedance form of the standard. This change in form will lead to changes in levels of stringency across the country, a topic needing further exploration.

**9. Level (Section 3.3.4): What are CASAC's views on the following:**

- a. **The approach taken by staff to identify potential alternative PM<sub>10</sub> standard levels, in conjunction with a 98<sup>th</sup> percentile form, including the weight placed on different studies?**

- b. **Staff's conclusion that the evidence most strongly supports standard levels around 85  $\mu\text{g}/\text{m}^3$ ?**
- c. **The alternative approach to considering the evidence that could support standard levels as low as 65  $\mu\text{g}/\text{m}^3$ ?**

CASAC concurs that the approach in identifying potential alternative  $\text{PM}_{10}$  standard levels are appropriate, with the discussion regarding the weight placed on different studies clearly and cogently presented. CASAC also considered that the proposed alternative standard levels of 85 and 65  $\mu\text{g}/\text{m}^3$  (based on consideration of 98<sup>th</sup> percentile  $\text{PM}_{10}$  concentration) could be justified.

CASAC, however, does not agree that scientific evidence most strongly supports an upper bound standard level of 85  $\mu\text{g}/\text{m}^3$ . As stated in the *Second Draft Policy Assessment*, scientific evidence supports the adoption of a standard at least as stringent as the current standard of 150  $\mu\text{g}/\text{m}^3$  based on one expected exceedance. Table A3 suggests that a 98<sup>th</sup> percentile level of 85  $\mu\text{g}/\text{m}^3$  is less stringent as compared to the current standard, protecting a smaller fraction of the population. Results instead point to a 98<sup>th</sup> percentile level between 75 and 80  $\mu\text{g}/\text{m}^3$  as comparable to the current standard. CASAC further notes that setting new 24-hour  $\text{PM}_{10}$  standard levels should also consider the impact of corresponding changes in  $\text{PM}_{2.5}$  standards, which will likely result in lower 24-hour  $\text{PM}_{2.5}$  concentrations and lower measured  $\text{PM}_{10}$  values. Thus, proportionately more coarse particle mass could be airborne at the standard level. Absent corresponding reduction in the  $\text{PM}_{10}$  standard, these lower  $\text{PM}_{2.5}$  concentrations would lessen the level of protection provided by the  $\text{PM}_{10}$  standard for exposure to  $\text{PM}_{10-2.5}$ .

The *Second Draft Policy Assessment* does not adequately convey the possible rationale for selecting the lower end of the proposed range of levels. Therefore, the considerations that might lead to selecting a  $\text{PM}_{10}$  standard level more stringent than afforded by the current standard should be more clearly elaborated. These considerations focus on margin of safety, particularly as it relates to the impact and weight given to suggestive findings of causality, to findings of positive but statistically insignificant results, and to exposure measurement error and other sources of uncertainty.

**10. Key Uncertainties and Areas for Future Research and Data Collection (Section 3.5):  
What are CASAC's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?**

See comments on Chapter 2.

The key distinction for this chapter is the need to seriously focus on  $\text{PM}_{10-2.5}$  for both mass and composition. CASAC looks forward to the planned implementation of monitors that measure  $\text{PM}_{10-2.5}$ , rather than  $\text{PM}_{10}$ . There is a critical need for national monitoring data on  $\text{PM}_{10-2.5}$  in order to provide a basis for epidemiological studies that focus on this size fraction. Furthermore, there is a need for speciated data to support health effects research. Spatial and temporal variability in coarse particle mass and composition need to be characterized. In addition, the national monitoring data will support a baseline for ambient air quality in order to compare with health effects data in order to assess whether there is a need for a more stringent standard.

The research areas described in the draft Section 3.5 are reasonable, but there needs to be strong emphasis on the critical need for coarse PM data, in order that the NAAQS can move beyond PM<sub>10</sub> as an indicator for thoracic coarse PM in a future NAAQS revision.

Another question to be considered is regarding what size cut-points are most appropriate, and also regarding what specific components are of most interest or concern with respect to health effects.

There is a need for continuous monitoring of coarse PM (and of PM<sub>2.5</sub>) in order to support health effects studies and to be able to assess alternative forms of possible future standards.

Other challenges for future research: (a) it may be difficult to get useful data from rodent inhalation studies since they can breathe particles only up to about 2 to 3 microns into their lung airways; (b) getting good chemical characterization of the particles will be a problem, since there are primary biological materials of potential interest in the thoracic coarse size range.

Prioritization of the research topics is needed, such as via a separate meeting or workshop.

### **Secondary Standard for PM-related Visibility**

#### **11. Current Approach (Section 4.1.3):**

- a. What are CASAC's views regarding our approach for translating technical evidence and assessment results into the basis for assessing current fine particle standards and considering alternative standards to provide protection against PM-related visibility impairment?**

The translation of technical evidence and assessment results as a basis for reviewing and revising the current secondary fine particle standard is logically conceived, clearly presented, and responsive to previous CASAC recommendations. The combined evidence-based and impact-based assessments effectively contrast and integrate the various combinations of metrics for protecting urban visibility. While this approach is inherently complex, it is clearly explained in the text and concisely summarized in Figure 4-1. The various tables and graphics in Chapter 4 and its associated appendices are helpful in communicating the inherent complexity that results from the evaluation of so many possible combinations of indicators, averaging times, levels and forms.

- b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (Section 4.2) and potential alternative standards (Section 4.3)?**

The detailed estimates of hourly PM light extinction under current conditions and for "what if" scenarios of just meeting current standards clearly indicate that the current PM<sub>2.5</sub> standards do not protect against levels of visual air quality which have been judged to be unacceptable in all of the available urban visibility preference studies. The levels are too high, the averaging times are too long, and the PM<sub>2.5</sub> mass indicator could be improved to correspond more closely to the light scattering and absorption properties of suspended particles in the ambient air.

While not discussed in detail in the *Second Draft Policy Assessment*, direct measurements of light extinction are the preferable indicator for an alternate standard to make an accurate assessment of the PM effect on urban visibility. These measurements would provide timely and easy-to-

understand results to address the protection of the public welfare from PM impacts, but without a Federal Reference Method (FRM) adopted or in the development process – these data are not currently available for most urban areas. Additional discussion of the timeline and process anticipated by EPA to advance direct measurement of light extinction monitoring methods to FRM status would be helpful.

Given this limitation, the detailed estimates of PM light extinction employed for 15 urban areas in the UFVA, and used to evaluate alternative new indicators including hourly PM<sub>2.5</sub> mass and “speciated PM<sub>2.5</sub> mass-calculated light extinction” in the *Second Draft Policy Assessment* are appropriate for the initial promulgation and first generation of regulatory air quality analysis and planning; similar to the process for the Regional Haze Rule. The speciated PM<sub>2.5</sub> mass-calculated light extinction indicator produces hourly extinction values quite similar to those resulting from more complex calculations, and it could be an appropriate indicator for a revised secondary standard, if employed on an interim basis until methods for direct light extinction measurements can be developed and deployed.

While the stated intent of the *Second Draft Policy Assessment* is “to provide as broad an array of options as is supportable by the available information”, the CASAC recommends providing additional and more focused discussion of the policy implications that may be associated with selecting and implementing specific combinations of indicators, levels and forms from within this broad array of options. Some discussion should also be provided to indicate that reductions in light scattering aerosols could decrease light extinction but increase radiative forcing, while reductions in light absorbing aerosols would decrease both light extinction and radiative forcing. The contributions of anthropogenic controllable “Short-Lived-Climate-Forcers” that contribute significantly to urban visibility impairment would also be worthy of some attention in the analysis of policy implications.

**12. Nature of the Indicator (Section 4.3. 1): What are CASAC’s views on the following:**

- a. **Staff’s consideration of the three indicators identified in this section and our conclusions on the appropriateness of these indicators for consideration in this review?**
- b. **The development and evaluation of a new approach that is based on using speciated PM<sub>2.5</sub> mass and relative humidity to calculate PM<sub>2.5</sub> light extinction by means of the IMPROVE algorithm?**
- c. **The assessment approach and results comparing the PM components that contribute to the hours selected in the top percentiles for PM<sub>2.5</sub> mass and PM<sub>10</sub> light extinction?**

As noted in past comments, CASAC strongly prefers directly measuring light extinction to using estimates based on mass measurements (e.g., the other options provided in the *Second Draft Policy Assessment*). In their recent review, the Ambient Air Monitoring and Methods Subcommittee (AAMMS) noted that there are commercial instruments available that provide light extinction measurements directly, and promising additional technologies may soon become available. The AAMMS also encouraged the EPA to begin the process of developing performance standards for PM light extinction measurements. However, a FRM for light extinction measurement does not yet

exist, and as EPA does not view it as practical to develop an FRM in time for this rule making, CASAC recognizes that alternative approaches need to be considered.

A current weakness of the *Second Draft Policy Assessment* is that it does not explicitly state the reasons that EPA does not currently recommend using a direct measurement of light extinction. It also does not provide any indication that the proposed mass-based indicators are intended for use on an interim basis, to be replaced with direct light extinction-based measurements as those methods are developed, tested and deployed. If staff consider it impractical to develop performance standards for an FRM in time for this round of rule making, this should be clearly stated and a schedule for developing such performance standards and evaluating candidate instruments should be specified well in advance of the next PM NAAQS review.

Assuming it is currently impractical to develop a FRM for direct measurements of PM light extinction in a sufficiently timely manner, CASAC agrees that for this rule making, a method to estimate extinction based on measurements from continuous PM<sub>2.5</sub> monitors, preferably adjusted by PM<sub>2.5</sub> speciation and relative humidity (RH) data, is appropriate. The “speciated PM<sub>2.5</sub> mass-calculated light extinction” method described in the *Second Draft Policy Assessment* appears to be a reasonable approach for estimating hourly light extinction. For purposes of “near real time” visibility tracking, CASAC recommends considering a simpler calculation in which historical, rather than concurrent, monthly or seasonal speciation averages would be used to estimate speciation for combining with real-time continuous PM<sub>2.5</sub> and RH data, even though the most recent speciation data would be used for developing plans for improving visibility. CASAC also recommends that the Agency consider developing the monthly or seasonal speciation estimates on a regional basis as well as on a site-specific basis, as this would allow light extinction estimates at all (>700) sites with continuous PM<sub>2.5</sub> data, rather than just the relatively few sites with collocated continuous PM<sub>2.5</sub> and speciation monitors.

**13. Alternative Levels and Forms (Section 4.3.3): What are Panel views on the following:**

- a. **The performance assessment which focused on the Candidate Protection Levels of 64, 112, 191 Mm<sup>-1</sup> for PM<sub>2.5</sub> light extinction and speciated PM<sub>2.5</sub> mass-calculated light extinction, and alternative levels of 10, 20, and 30 µg/m<sup>3</sup> for PM<sub>2.5</sub> mass concentration?**

These are appropriate CPL and PM<sub>2.5</sub> levels. The CPL values were based on all visibility preference data that are available and bound the study results as represented by the 50% acceptability criteria. However, the presentation could be improved by expanding some of the tables to include 10 and 40 dv values, in that at 10 dv, no viewer found the scene to be unacceptable, and at 40 dv, virtually all viewers found all scenes to be unacceptable. What would these dv levels correspond to in the context of PM<sub>2.5</sub> and the various percentile levels?

- b. **Use of three-year averaged 90<sup>th</sup> and 95<sup>th</sup> percentiles in conjunction with a 1-hour daily maximum form and use of three-year averaged 98<sup>th</sup> percentile in conjunction with the all daylight hours form?**

While these levels may be appropriate, they are not well justified. A cursory argument was made that the 90–95<sup>th</sup> percentiles in conjunction with the 1-hour daily maximum identified similar days

and hours of non-compliance, as did the 98<sup>th</sup> percentile in conjunction with all daylight hours, and this correspondence was a sufficient basis to pick these two approaches. It would be informative to compare all, or at that least the same, percentiles for both all days and the daily hourly daily maximum. These analyses should be informative as to whether one approach is preferred. Whether different sources might be identified, depending on use of daily average or maximum values has not been adequately addressed. For example, a significantly extended episode of low visibility might be attributed to a single source, such as a large wildfire or prescribed fire, which would result in the all hour, all day approach targeting only one large emission episode that occurred for only one or a few time periods. For wintertime episodes in many cities of multi-day poor urban visibility conditions, the events can cross the end of the calendar year, tracking the highest daily hour for each day to form a full 3-year distribution of values (i.e.,  $N = \sim 1,095$ ) for which the compliance value is then compared to the percentile level selected by EPA.

- c. **Insights to be drawn by comparing the PM components for hours included among the 10% highest for a 1-hour daily maximum form with the hours included among the 2% highest for an all daylight hours form, for the various indicators considered (Appendix C)?**

See comments above. These two approaches appear to be similar; however, it would be helpful to quantify the similarities as opposed to relying only on a qualitative discussion. A scatter plot might be useful for the 14 sites that provides the average fractional contribution of a species in relation to the time metric used. Additionally, comparisons should be shown for the specific days found in non-compliance by metric.

#### **14. Key Uncertainties and Areas for Future Research and Data Collection (Section 4.5):**

**What are CASAC's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?**

The major areas of research and data collection needed to address key uncertainties related to a visibility-based secondary standard are nicely captured in Section 4.5 of the *Second Draft Policy Assessment*. The section appropriately identifies two major areas of need, one related to visibility preference, and one related to methods of measurement.

In the first category, preference studies, the details noted by EPA all identify a strong need for additional urban visibility preference studies conducted using consistent methodology. The range of 50% acceptability values discussed as possible standards are based on just four studies (Figure 4-2), which, given the large spread in values, provide only limited confidence that the benchmark candidate protection levels cover the appropriate range of preference values. Studies using a range of urban scenes (including, but not limited to, iconic scenes – “valued scenic elements” such as those in the Washington DC study), should also be considered.

In the second category related to methods of measurement, CASAC supports the proposal to conduct studies in several cities, pairing direct monitoring of light extinction with enhanced monitoring of PM size and composition distributions (i.e., continuous PM speciation monitoring). Additional work should also be conducted to understand the contribution of  $PM_{10-2.5}$  in

southwestern areas other than Phoenix, to address the lack of information for scattering associated with this fraction of PM<sub>10</sub> as is noted on page 4-30.

Underlying this overall discussion is a clear need for better particle size – composition distribution information (i.e., particle composition distributions as a function of particle size). These data gaps are addressed in different ways in the discussion of future research needs elsewhere in the Second Draft Policy Assessment (Sections 2.5 and 3.5). Moreover, the development of continuous monitoring methods for specific PM components addressed in Section 2.5 is equally applicable here. Improved understanding of size-dependent PM composition would also help address the questions related to the role of scattering and absorbing aerosols in climate forcing that are raised in Section 5.2.4.

Finally, a number of research and data collection topics overlap between the secondary PM NAAQS, and the PM<sub>2.5</sub> and PM<sub>10</sub> primary PM NAAQS. For example, the fraction of combustion-related primary carbon PM species can be an important indicator of harmful health effects, visibility impairment and climate forcing.

With these characteristics, research to jointly quantify and reduce these primary PM carbon species from combustion sources would advance the information available to the Administrator for her judgment about the necessary level of protection to be provided by the future PM NAAQS, to be assessed in the next review cycle.

CASAC suggests that EPA look for additional opportunities to align health and welfare improvement strategies simultaneously for common indicators, such that the next reviews of the PM and other NAAQS have not only the analyses of the effects of PM and other NAAQS indicators on health and welfare, but also include metrics useful for measuring progress toward attainment.

**Appendix A: Compendium of Individual Comments  
CASAC Particulate Matter Review Panel on  
Policy Assessment for the Review of the Particulate Matter National Ambient Air Quality  
Standards (Second External Review Draft, June 2010)**

<b>Dr. Lowell Ashbaugh</b> .....	A-2
<b>Mr. Ed Avol</b> .....	A-5
<b>Dr. Joseph D. Brain</b> .....	A-9
<b>Dr. Wayne Cascio</b> .....	A-12
<b>Dr. Christopher Frey</b> .....	A-17
<b>Dr. Rogene Henderson</b> .....	A-26
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<b>Dr. Helen H. Suh</b> .....	A-61
<b>Dr. Sverre Vedal</b> .....	A-62

**Dr. Lowell Ashbaugh**

These comments are directed toward Chapters Four and Five of the Policy Assessment. I was very pleased with this draft. EPA staff has done an excellent job of responding to CASAC comments and has produced a very readable and informative document. I have a few minor editorial comments that I will enumerate below, but first I have a few more general comments.

On pages 4-32/4-33 an unstated advantage of direct measurement of light extinction is the immediate response obtained. In contrast the process of collecting filters, analyzing them, and performing the data validation necessary to calculate reconstructed light extinction takes a significant amount of time. Direct measurement of light extinction could provide immediate feedback to planning agencies and could be used for alerts and behavior modification, if necessary. Furthermore, the increased analytical sensitivity achieved by sampling for longer periods makes speciated PM<sub>2.5</sub> calculated light extinction better for longer term averaging than for short term applications. This concept is particularly important in the ten-step simplified approach outlined on pages 4-34/4-35. The inherent uncertainties in the speciated measurements used in this method might be significantly enhanced with this method. It would be important to perform a critical analysis of these uncertainties prior to using it.

The findings of the WACAP study described briefly on page 5-21 are important in identifying that the source of airborne contaminants is nearby emissions and not those transported from Eastern Europe or Asia. This should be highlighted to avoid using scarce resources on projects that assume long-range transport is more important.

Page	Line	Comment
4-31	20	Change “wide spread” to “widespread”
4-36	15	insert “of” between “because” and “the differing”
4-38	25	add a space between “PM <sub>2.5</sub> ” and “mass”
4-39	9	remove the comma after “document”
4-40	9	add a space between “daylight” and “1-hour”
4-46	6	should this be “4 of the 14...”?
5-2	17	remove the comma after “1997”
5-5	3	remove the comma
5-9	7	change “effects” to “affects”
5-9	8	remove the comma after “thus”
5-9	33	change “are” to “is”
5-13	1	change “are” to “is”
5-13	14	add “comes” at the beginning of the line
5-16	3-4	move “to” inside the numbered items (i.e. “are (1) to identify...and (2) to qualitatively

## Charge questions

Chapter 4 (Secondary Standard for PM-related Visibility)

### 11. Current Approach (section 4.1.3):

**a. What are the Panel's views regarding our approach for translating technical evidence and assessment results into the basis for assessing current fine particle standards and considering alternative standards to provide protection against PM-related visibility impairment?**

The approach is sound – it follows a logical step-by-step process and is explained very well. Figure 4-1 provides an excellent road map of the approach.

**b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 4.2) and potential alternative standards (section 4.3)?**

Yes, the approach is applied well. Staff has taken a complex process and simplified in very well into a readable document. I made a few comments above on section 4.3 regarding the advantages of direct light extinction measurement for fast response, and the suitability of speciated PM<sub>2.5</sub> calculated light extinction for longer term averages. In particular, the ten-step simplified approach for calculating hourly extinction is subject to high uncertainties that should be analyzed prior to attempting to implement it.

### 12. Nature of the Indicator (section 4.3. 1): What are the Panel's views on the following:

**a. Staff's consideration of the three indicators identified in this section and our conclusions on the appropriateness of these indicators for consideration in this review?**

Staff has provided an excellent discussion of the merits of the three indicators. I would only add that the direct light extinction measurement can be accomplished immediately and could provide important feedback for encouraging behavior and emission adjustments that could curtail widespread air pollution events as they unfold.

**b. The development and evaluation of a new approach that is based on using speciated PM<sub>2.5</sub> mass and relative humidity to calculate PM<sub>2.5</sub> light extinction by means of the IMPROVE algorithm?**

This approach is good when applied to longer term averages, but I have reservations about its use for short term (hourly) applications. The inherent uncertainties in the measurements may be magnified significantly in the short term. This needs to be carefully evaluated prior to using it.

**c. The assessment approach and results comparing the PM components that contribute to the hours selected in the top percentiles for PM<sub>2.5</sub> mass and PM<sub>10</sub> light extinction?**

This approach and assessment are well thought out and are presented well.

### 13. Alternative Levels and Forms (section 4.3.3): What are Panel views on the following:

**a. The performance assessment which focused on the Candidate Protection Levels of 64, 112, 191 Mm<sup>-1</sup> for PM<sub>2.5</sub> light extinction and speciated PM<sub>2.5</sub> mass-calculated light extinction, and alternative levels of 10, 20, and 30 µg/m<sup>3</sup> for PM<sub>2.5</sub> mass concentration?**

The logic behind this selection of Candidate Protection Levels is explained well; staff has done a commendable job of explaining the performance of the Alternative Standards. Table 4-5 is a clear representation of how the CPLs would perform in the 14 urban areas examined.

**b. Use of three-year averaged 90th and 95th percentiles in conjunction with a 1-hour daily maximum form and use of three-year averaged 98th percentile in conjunction with the all daylight hours form?**

The use of these percentiles and forms is explained well. Staff has done an excellent job of describing the steps used to get to this selection.

**c. Insights to be drawn by comparing the PM components for hours included among the 10% highest for a 1-hour daily maximum form with the hours included among the 2% highest for an all daylight hours form, for the various indicators considered (Appendix C)?**

This display of results is very informative. My primary complaint is that the labels on the graphs are difficult to read because of the formatting necessary to fit them all on the page. The staff discussion explains the plots well; I had no problem following it.

**14. Key Uncertainties and Areas for Future Research and Data Collection (section 4.5):**

**What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?**

Staff responded very well to the panel's request for a section on future research needs. I am especially pleased to see a discussion of the need for additional visibility preference studies to assess (or try to reduce) the differences in response between people in different urban areas. The call for a pilot light extinction monitoring program is also highly important.

## **Mr. Ed Avol**

### General Comments

The second draft of the Policy Assessment for PM is a marked improvement over the earlier version. The discussions contained within are more focused, more targeted, and by virtue of the presentation, more convincing. Staff has generally been very responsive to comments provided on the first draft Policy Assessment.

In the course of presentation, there is repeated reference to “currently available scientific and technical information” as the basis for making informed judgments. This is entirely appropriate, but if there is not an assessment of missing gaps and data needs desired for the next review cycle (along with a subsequent commitment to devoting resources and energy to closing those gaps), progress will be slow in achieving the necessary or desired threshold of sufficient information on which to make additional informed and improved judgments. That is why Sections 2.5 and 3.5 (“Key Uncertainties and Areas for Future Research and Data Collection”) are such welcome and thoughtful additions, for which staff should be duly commended. This is a key element of encouraging substantive improvements in future review cycles, and should be a part of every subsequent pollutant review.

That is not to say that the current draft could not still be improved. There are still occasions in the text where there is a tendency to lapse into presentation of data, rather than referral to data presented in the ISA or RA documents. There are several sentences, paragraphs, and sections that meander a bit, and could be tightened up. The overall document could still be edited and reduced in length. That said, however, the formulation, approach, and presentations have significantly and positively evolved, and this general approach should be conceptually preserved for future policy assessments for other pollutants.

### Specific Comments

P1-12, lines 6-9 – The statement (and/or the thinking behind the statement) is not well-expressed here. I would propose that the purpose for reviewing the emerging evidence on ultrafine particles is not to regulate PM<sub>2.5</sub> “...or categories of fine particle sources...”, but rather to identify whether there is a basis for promulgating a health-protective standard for ultra-fine particles, which have a different constellation of sources, control strategies, exposure pathways, and health outcomes than PM<sub>2.5</sub>.

Pg 2-50, line32-34 – This question and answer seems like a circular argument. The fact that most studies utilize the annual and 24hr averaging times as the metric of analysis should not be seen as justification for having them. Rather, they are a reflection of the fact that they are the de facto “standard” metrics or “currency of the realm”.

Pg 2-52, line1-3 – This apparent inconsistency raises a possible question as to whether there is a lag effect of PM, with exposure leading to hospitalization in the winter, increased fragility or susceptibility, and increased risk of death several months later in the warm season, when PM is nearly as elevated.

Pg2-86, lines 19-21 – If this is not the appropriate forum for discussion (and it arguably is not), then what is the appropriate forum to discuss/present the research recommendations needed to meet standards implementation and strategy development? This would seem to be a valuable discussion that should be held. Moreover, it should be tied closely to the review cycle of pollutants, in order to motivate continuing improvements in regulation and public health protection.

Pg 3-8, Figure 3-1 – This figure seems incomplete, with the several boxes at the bottom missing. Shouldn't there be pathways and boxes for alternative and retained indicator, averaging time, form, and level options, respectively (so two possibilities for each element of the standard), and shouldn't that lead to a retention of or alternatives to the current standard? The flow chart for review of the PM2.5 standard (Figure 2-1, Pg 2-12) is depicted in a similar but slightly different from, but shouldn't these two figures be conceptually identical?

#### Minor Comments (typos, etc)

The inherent writing style involves systematic (and arguably excessive) use of compound, complex, and sometime convoluted sentences throughout the document. Sentences fewer than three or more lines are rare. This often makes it difficult for readers to follow and understand the discussion. Multiple ideas are often conveyed within one meandering statement. Improved efforts should be made to be clear, concise, and brief.

Pg ix, definition of FEV1 – this is not the change in FEV1 (which would be “delta’ FEV1), but rather the volume of air exhaled in the first second of exhalation.

Pg xi, definition of PMx – 7th line should read “...diameter are collected with an efficiency that decreases...”

Pg 1-10, line 26 – replace “...we considered...” with “staff considered...”

Pg 1-11, line 6 – replace “...we revised...” with “...staff revised...”

Pg 1-11, lines 14-15 – were there really two second drafts of the REA? Don't you mean two drafts of the REA?

Pg 2-3, lines 1-5 – Something is grammatically awkward or incorrect here. I suggest re-wording to read: “This conclusion was based on a key observation: most of the aggregated annual risk ...”

Pg 1-11, line 21 – replace “...we will...” to “...staff will...”.

Pg 1-11, line 25 – replace “We plan to release the final...” with “Plans call for release of the final...”

Pg 2-3, line 2 – insert comma after “...risk assessment...”

Pg 2-7 lines 23,27,34,... - This document begins in the third person (“staff” determines or “staff” found this or that...), then gradually switches over to the first person (Our, we, ...). My personal opinion is that the third person is more appropriate, but consistency of presentation is another issue.

Pg 2-16, line 34 – Here, CVD is defined as cerebrovascular disease, but in the List of Acronyms at the start of the document, CVD is listed as cardiovascular disease.

Pg 2-22, line 29 – Delete “These studies also...”, or complete the thought.

Pg. 2-45, line 14 – Based on current understanding (and the referenced text in the ISA), it’s the particle size, NOT the greater surface area, of UFPs that increases the potential to cross cell membranes and epithelial barriers. The current sentence in the text here should be changed to correct this.

Pg 2-69 footnote 52, line 4 – should read “in fact”, not “if fact”

Pg 3-27, lines 1-4 – The discussion in the section refers to “Western”, “East”, and “Southwest”, but the referred-to figure (Figure 3-4) is identified in terms of “Mediterranean”, “Dry”, “Dry Continental”, etc. The footnote on p3-26 explaining the designations identifies the Figure groupings by yet another way - specific states (e.g., “The Mediterranean region includes CA, OR, WA.”) So, there are three slightly different designations in the same discussion about overlapping (but not the same) areas (e.g., “Mediterranean” seems to include both Southwest (CA) and Northwest (OR, WA) entries). If the inclusion of specific areas varies by definition in each of these three treatments, what are we to infer from the apparent variations between regions shown in the figure?

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Panel Charge Questions for the Primary Standards

1. Current Approach for Fine PM – Staff has generally done an excellent job in summarizing the available evidence and reviewing the adequacy of current and potential alternative standards.
2. Form of the Annual Fine PM Standard – The issue of susceptible populations remains a challenging issue that cannot be minimized or ignored. Spatial averaging has the potential for reducing the importance of the potentially higher exposures encountered where susceptible populations may reside. Accordingly, in consideration of “allowing an adequate margin of safety”, this approach should not be used.
3. Alternate Level for Fine PM – Presentation was appropriate and adequate.
4. Key Uncertainties for Fine PM – Staff should be commended for an excellent job in developing this section. A prioritized listing of needs would be a next level of improvement, but the relative and varying perception of priorities may make this a challenging undertaking.
5. Current Approach for Coarse PM – Generally well done and convincing.
6. Adequacy of the Current PM10 Standard – Reasonable and logical approach with presentation of objective criteria and evidence on which to base current determinations.
7. Indicator of Coarse PM – The presentation seemed reasonable, in view of the available evidence.

8. Form of the Coarse PM Standard – Seems reasonable.
9. Level of the Coarse PM Standard – Generally well-constructed presentation and discussion; Some questions remain as to why staff presented information in the 65-85 $\mu\text{g}/\text{m}^3$  range, but recommended the higher end of the range. Where and how does an “adequate margin of safety” for public health enter into this recommendation?
10. Key Uncertainties for coarse PM – Excellent compilation of research needs to be addressed in the next/current cycle of research. As in the case of PM<sub>2.5</sub> recommendations, prioritization might be useful to apply/maximize the use of limited resources.

**Dr. Joseph D. Brain**

**Overall Assessment**

The June 2010 draft of the PA for PM demonstrates considerable progress. EPA staff took seriously CASAC's suggestions and this current version is much improved. Major concerns of CASAC have been addressed. The nature of the recommendations are clear, and the advice of EPA staff is clearly grounded on data and clearly stated arguments.

**Answers to Charge Question 5: Current Approach for Coarse PM**

**Current Approach (sections 3.1.4, 3.2, 3.3):**

- a. What are the Panel's views on the approach to translating the available evidence and air quality information into the basis for reviewing the coarse particle standard?

The panel finds the second draft superior to the first draft discussed earlier. EPA staff has done its best to take the available evidence relating to exposure and health effects and to use them as the basis for reviewing the coarse particle standard. There are inherent deficiencies which persist. The coarse particle fraction--particles between 2.5 and 10 $\mu$ --can only be estimated by subtraction. Coarse particles are not measured directly. Moreover, the health effects studies suffer from an adjacent defect. We can only look at PM10 studies and try to estimate the extent to which the health effects observed relate to the entire size range collected or to only that fraction of coarse particles.

*In toto*, Chapter 3 reads well and is much improved. EPA staff has done its best to describe an evidence-based approach for applying the limited amount of health effects evidence and air quality information in different US regions into a basis for reviewing the adequacy of the current coarse particle standard.

- b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 3.2) and potential alternative standards (section 3.3)?

We believe that the answer to this question is yes. Given some deficiencies in data for both the exposure and health outcome side, the EPA staff has carefully delineated the limitations of the data available to them. They have done their best to use these data and to address the question of whether current standards are adequate. They also do an excellent job of discussing possible alternative standards and the implications of applying them.

*A New Concern Not Currently Adequately Addressed:*

Page 3-1. This chapter focuses on "thoracic coarse particles," which it defines as those particles with an aerodynamic mass median diameter between 10 microns and 2.5 microns. To what extent are the risks associated with particles in this size range confined to the thorax? Particularly, during quiet breathing (primarily via the nose), there will be considerable deposition of these particles in the nose. What impact do they have on nasal inflammation and injury? Do such particles interact with exposure to allergens? There is increasing evidence that some metals and even nanoparticles

can be transported from the nose through epithelial and olfactory sensory neurons, through the olfactory bulb, to the brain. To what extent should we also worry about the impact of these particles on the nose and the CNS? It's a little late to bring this up, but this aspect should at least be acknowledged, if not in this document, at least in future versions. It should be on our radar screen.

### **Minor Comments**

Page ES1, Third Paragraph, Line 11. Ordinarily, one would give the lower end of the range first. Why not change this to "11-13  $\mu\text{g}/\text{m}^3$ ."

Page ES2, Four Lines from Bottom. There seems to be a missing verb. Shouldn't this line read "...there is sufficient information...?"

Page ix (List of Abbreviations), Line 11. Delete the words "change in."

Page 2-32, Line 14. I'm not sure what staff means by the word "peakiness." It is sometimes used in relation to waveforms, particularly in relation to speech, but I don't know what it means in this context. I'm also unclear as to what they mean in Line 15 by "rollback approach." This is the first sentence of this paragraph, and is thus an important topic sentence. It should be rewritten and clarified.

### **Adjacent Concerns**

Discussions of the PM standard as well as this second draft of the PA raise long term generic issues. While not conveniently address is this document, I believe that CASAC should begin thinking about these issues and make suggestions to solve them. We recognize that the time for implementation may be decades. Two topics come to mind:

#### ***1. PM Sampling Strategy***

The panel suggests a more rational design of exposure assessment. This would involve thinking of the ideal size cuts to address size ranges of interest. What should be the cutpoints? Where and how should these devices be deployed? The goals would be a far more rational and useful design of exposure assessment, and one which would be coupled to the next generation of health outcome studies. A long term process is needed in order for the next generation of sampling devices to be developed, calibrated, and deployed.

There is also a continuing cry for a more thoughtful assessment of particle composition. There is increasing evidence that the extent of particle toxicity relates to the composition and solubility of the particles. There is also concern about the most appropriate metric. Should standards really be mass-based or should they reflect numbers or surface area of particles? The composition issue is particularly relevant to discussions of coarse particles. How do we make the distinction between those derived from fossil fuel combustion and resuspended crustal dust? There is consensus that resuspended crustal dust is less toxic than combustion products. There are clear regulatory implications as well. It's hard to regulate dust storms, but easier and more appropriate to regulate stationary and mobile sources.

## ***2. Renewal of the Clean Air Act (CAA)***

Pages 1-2 and 1-3 lucidly discuss the requirements of the Clean Air Act. The first CAA was passed in 1963, and it was then amended in 1966 and 1970. The next major revision was in 1990. CASAC should contribute to the process of renewing and refining the Clean Air Act. We have discussed inherent problems. We have discussed repeatedly some of the inherent problems with the current version of the Clean Air Act. Some of the requirements simply cannot be met. Particularly for PM, we cannot protect all citizens, particularly the most vulnerable ones, and protect them with an adequate margin of safety. We need to craft language which maximizes public health but is also consistent with what we know about health outcomes and PM exposure. We have not yet identified a threshold – an assumption inherent in the current Clean Air Act.

We should also discuss whether regulating individual pollutants makes sense. To what extent should mixtures be regulated? What about new chemicals known to be toxic? These and other problems should be comprehensively addressed. Perhaps this is too big a job for CASAC, given its continuing responsibilities and the increased pace of activity in relation to criteria pollutants. But we should advocate for such a process, and suggest mechanisms to achieve it.

**Dr. Wayne Cascio**

General Comments:

The EPA staff has responded to the comments of CASAC and markedly improved the Policy Assessment. The text is more focused and the rationale for the conclusions reached is now better justified. The text remains long but much easier to read. There remain many typographical errors that will undoubtedly be identified in proof, but I would like to point out one reference that appears to be in error. The reference Zanolotti A, Schwartz J. (2009) on 3-50 the correct citation is 117:898-903. Epub 2009 Feb 13, rather than 117:1-40, 2008.

Chapter 2 (Primary Standards for Fine Particles)

**1. Current Approach (section 2.1.3):**

**a. What are the Panel's views on the staff's approach to translating the available epidemiological evidence, risk information, and air quality information into the basis for reaching conclusions on the adequacy of the current standards and on alternative standards for consideration?**

Comment: The approach is systematic, logical and explained clearly. Figure 2-1 is very useful in conveying the details of the approach.

**b. Has staff appropriately applied this approach in reviewing the adequacy of the current standards (section 2.2) and potential alternative standards (section 2.3)?**

Comment: The staff has been consistent in their application of the approach described in section 2.1.3 and illustrated in Figure 2.1.3. The EPA staff has struck a good balance between the evidence-based and risk-based considerations and associated uncertainties to determine the adequacy of the current standards.

**2. Form of the Annual Standard (section 2.3.3.1):**

**a. What are the Panel's views on the additional analyses conducted to characterize the potential for disproportionate impacts on susceptible populations, including low income groups and minorities associated with spatial averaging allowed by the current annual standard?**

Comment: Some individuals with specific medical conditions, and children represent susceptible populations whose pathophysiologic response to PM exposure is enhanced. Individuals of low social position who reside disproportionately in areas of higher exposure might also share a greater susceptibility to the impact of PM exposure. The additional analyses provided characterizing the potential for disproportionate impact on such a population allowed by spatial averaging is appropriate.

**b. In light of these analyses, what are the Panel's views on staff's conclusion that the form of the annual standard should be revised to eliminate spatial averaging?**

Comment: Based on the requirement to protect susceptible individuals it is appropriate to eliminate spatial averaging.

**3. Alternative Levels (section 2.3.4): What are the Panel's views on the following?**

**a. The insights that can be gained into potential alternative standard levels by considering: i. Confidence bounds on concentration-response relationships?**

Comment: Figure 2-3 is useful in conveying the confidence bounds on PM<sub>2.5</sub> C-R relationship. The figure would benefit from putting two panels on one page and the third panel on a second page. The size of the images and associated text are too small to easily understand the message.

**ii. Different statistical metrics that characterize air quality distributions from multicity epidemiological studies?**

Comment: Appropriate.

**b. Potential alternative annual standard levels based on composite monitor distributions versus maximum monitor distributions?**

Comment: The composite monitor distributions appear to be quite robust and stable when compared to the maximum monitor distributions, and therefore is preferred.

**c. Use of risk information in informing staff conclusions on alternative annual and 24-hour standard levels, including approaches used to assess overall confidence and potential bias in the risk estimates?**

Comment: The risk information particularly Figures 2-11 and 2-12 is described clearly and is utilized appropriately by the EPA staff to draw reasonable conclusions about the alternatives for the annual and 24-hour standard levels.

**d. Staff's conclusion that alternative annual standard levels in the range of 13 to 11 µg/m<sup>3</sup> are most strongly supported by the available evidence and risk-based information?**

Comment: An alternative annual standard level in the range of 13 to 11 µg/m<sup>3</sup> is supported by the available evidence and risk assessment. While a threshold does not appear to exist at lower concentrations the uncertainties do explode and limit confidence of the magnitude of the health effect at lower concentrations.

**e. Staff's approach of focusing on peak-to-mean ratios to inform the level of a 24-hour standard that would provide supplemental protection to a generally controlling annual standard?**

Comment: This is a reasonable approach.

**f. Staff's conclusion that consideration should be given to retaining the current 24-hour standard level of 35 µg/m<sup>3</sup> in conjunction with annual standard levels in the range of 13 to 11**

**µg/m<sup>3</sup>, and that consideration could also be given to an alternative 24-hour standard level of 30 µg/m<sup>3</sup> particularly in conjunction with an annual standard level of 11 µg/m<sup>3</sup>?**

Comment: Reducing the annual standard from 15 to 13 µg/m<sup>3</sup> is predicted to provide a significant public health benefit. Reducing the 24-hours standard from 35 to 30 µg/m<sup>3</sup> is also predicted to provide significant public health benefit. The 30/11 option would provide the greatest protection to the largest number of people in the U.S., yet even this option will probably not offer optimal protection the most at risk populations, e.g. those with greater susceptibility to the effects of PM.

**4. Key Uncertainties and Areas for Future Research and Data Collection (section 2.5):  
What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?**

Comment: The Key uncertainties and areas for future research and data collection presented in section 2.5 are quite comprehensive and informative. Gaps in knowledge needed to eliminate uncertainties and improve risk assessment are identified in a wide range of areas including components and sources, ultrafine PM, co-pollutant exposures, exposure related factors, health effects, C-R relationships, and duration of exposure, susceptible populations, genetic and epigenetic susceptibility, and social position. Moreover to answer the numerous questions related to the various issues described above, improvements are needed in data collection and monitoring methods as described on page 2-89. To answer all of the policy related questions will require a vast amount of resources and time. For this reason the EPA, the NIEHS and other relevant federal agencies should work collaboratively to establish priorities to determine which questions would provide the most cost-effective additions to our knowledge to inform policy relevant questions and disease mechanisms needed and address this important public health issue.

Chapter 3 (Primary Standard for Coarse Particles)

General comment: In reviewing the recently up-dated Chapter 3 it is agreed that EPA staff provided significant revisions in the 2nd draft Policy Assessment to the discussions of the current and potential alternative standards. The addition of Figures 3-2 and 3-3 that summarize the epidemiological evidence and air quality data relevant to the adequacy of the current standard add considerably to understanding the rationale for EPA's conclusions.

The discussion of potential alternative standard levels reads well and staff conclusions are well justified. The discussion was improved by adding Figures 3-5 and 3-6 that summarized the epidemiological evidence and air quality data related to PM<sub>10</sub> and PM<sub>10-2.5</sub>.

**5. Current Approach (sections 3.1.4, 3.2, 3.3):**

**a. What are the Panel's views on the approach to translating the available evidence and air quality information into the basis for reviewing the coarse particle standard?**

Comment: The approach as outlined in Figure 3-1 provides a concise and logical approach to translating the available evidence and air quality information into the review of the adequacy of the current standard. The approach is logical and relies on accumulated evidence linking PM<sub>10-2.5</sub> to

adverse health effects. However, in contrast to the abundant evidence for PM<sub>2.5</sub>, the authors had to contend with several serious limitations. These include limited epidemiological data specifically related to PM<sub>10-2.5</sub> and very limited toxicological data in animal models, regional and spatial characteristics that complicate the generalization of exposures over a city or region, and a surrogate measure of PM<sub>10-2.5</sub>, i.e. PM<sub>10</sub> that contains PM<sub>2.5</sub>. Nevertheless, the authors provide an excellent review of the evidence, and the value of that evidence in informing the risk for overall mortality and cardiovascular and respiratory effects.

**b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 3.2) and potential alternative standards (section 3.3)?**

Comment: The EPA staff has utilized the approach described successfully.

**6. Adequacy of the Current PM10 Standard (section 3.2): What are the Panel's views on the alternative approaches presented for considering the evidence and its uncertainties as they relate to the adequacy of the current standard?**

Comment: It appears clear in reviewing the current literature and epidemiological studies that the present standard is not sufficient to protect health. While uncertainties remain for many different reasons, the overall judgment is that the alternatives are likely to provide increased protection of human health.

**7. Indicator (section 3.3.1): What are the Panel's views on the approach taken to considering standard indicator and on staff's conclusion that PM10 remains an appropriate indicator in this review?**

Comment: Given the availability of the health data, the associated health risk, and the present monitoring system, PM<sub>10</sub> is the only reasonable indicator for coarse PM at the present time.

**8. Form (section 3.3.3): What are the Panel's views on the approach taken to considering the form of the standard and on staff's conclusion that revising the form to a 98th percentile form would be appropriate for a 24-hour PM10 standard meant to protect against exposures to thoracic coarse particles?**

Comment: Based on the discussion provide by the EPA staff the 98<sup>th</sup> percentile method appears to be the optimal form for the 24-hour standard.

**9. Level (section 3.3.4): What are the Panel's views on the following:**

**a. The approach taken by staff to identify potential alternative PM10 standard levels, in conjunction with a 98th percentile form, including the weight placed on different studies?**

Comment: Appropriate. This concentration-based standard will be better matched to the health effects, will better compensate for missing data and as described on page 3-31 is predicted to give "proportionally greater weight to days when concentrations are well above the level of the stand than to days when the concentrations are just above the level of the standard."

**b. Staff's conclusion that the evidence most strongly supports standard levels around 85  $\mu\text{g}/\text{m}^3$ ?**

Comment: A standard around 85  $\mu\text{g}/\text{m}^3$  is easily supported by the evidence and will generally provide equal protection to the current standard with some enhance improvement in some urban areas. Yet, such a standard will fail to protect a significant number of individuals as indicated by the studies of Zanobetti and Schwartz (2009) and Peng et al. (2008) where significant health impacts were measured with  $\text{PM}_{10}$  98<sup>th</sup> percentile concentration was 78  $\mu\text{g}/\text{m}^3$  and 68  $\mu\text{g}/\text{m}^3$  respectively. It is reasonable to consider a standard below 85  $\mu\text{g}/\text{m}^3$ .

**c. The alternative approach to considering the evidence that could support standard levels as low as 65  $\mu\text{g}/\text{m}^3$ ?**

Comment: The available evidence provides a justification for a 24-hour standard to lower values if positive but non-statistically significant associations are judged important, but justification near or below 65  $\mu\text{g}/\text{m}^3$  is weak. New data from future studies will be necessary to resolve uncertainties in the vicinity of 65  $\mu\text{g}/\text{m}^3$  and at lower concentrations. Solutions might come in the form of more direct measures of  $\text{PM}_{10-2.5}$  and chemical characterization of the PM, and influence of co-pollutants.

**10. Key Uncertainties and Areas for Future Research and Data Collection (section 3.5): What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?**

Comment: Over the last several years, sufficient evidence has emerged regarding the adverse health effects of coarse PM, yet in contrast to fine PM the knowledge base regarding coarse PM or  $\text{PM}_{10-2.5}$  is limited, and many significant gaps are present in our understanding the C-R of its health effects. The key uncertainties presented in section 3.5 provide a broad overview of the areas of information that are needed to fill these knowledge gaps and develop and justify more effective control strategies. Understanding sources and components of  $\text{PM}_{10-2.5}$ , and modification of effects by co-pollutants is essential, and defining the concentration-response relationships accurately is extraordinarily important. Establishing the differential effects of PM mass on the various organ systems (heart, blood vessels, lungs, central nervous system, hematopoietic and immunity), reproduction and fetal development is key to understanding the contribution the overall risks. Also consideration should be given to attaining a better understanding of the spatial distribution and constituents of coarse PM and how they relate to local environments and human activity, such as traffic, industry or agriculture.

## **Dr. Christopher Frey**

Charge Question 3: What are the Panel's views on the following:

Confidence bounds: The report seems to argue that there is not an adequate basis to consider concentration-response (C-R) confidence bounds quantitatively when developing or assessing potential alternative standard levels. However, as shown in Tables 2-2 and 2-3, 95 percent confidence intervals are estimated for the health effects endpoints for long-term IHD mortality and short-term CV mortality and hospital admissions.

What is not entirely clear to the reader is what is meant by "evidence-based considerations" and why this is different than "risk-based considerations." The risk assessment is based also on evidence, so the distinction is not clear.

On page 2-57 it is stated that there are epidemiological studies that report 95% confidence intervals for the effect estimates. A statement is made, that is a bit unclear, as follows (lines 25-27): "these analyses do not provide evidence of a concentration below which the confidence interval becomes notably wider and uncertainty in a C-R relationship substantially increases." Perhaps this statement is attempting to convey first the notion that the reported CIs are applicable to the range of ambient concentrations observed in the epidemiological study, and that EPA is making a judgment that the CI's should not be extrapolated to other values of ambient concentration. Second, the idea seems to be that if the C-R relationship would be applied to ambient concentrations that were not the basis of the specific epidemiological study, that the confidence intervals would widen. These assumptions could be stated more clearly.

The next sentence is even more unclear (p 2-57, lines 27-30). What is an "unacceptable degree of uncertainty"? What is a "continuing C-R relationship"? The notion that "the possibility that an effects threshold may exist becomes more likely" is likewise unclear. Since the intended meaning is unclear, it is not possible to propose an alternative wording.

A key point is that there are few PM2.5 studies for which confidence bounds are reported for C-R functions. On page 2-58, lines 4-7 a purpose for the estimation of the CIs is given with an implication perhaps that somehow these CI's are not relevant. It is not surprising, of course, that the CI's would widen as ambient concentration decreases into a range for which there are fewer ambient data. A point not discussed, however, is whether the confidence intervals widen such that the effects estimates are not statistically significant. Even if not statistically significant, is there an indication of an effect at the central tendency of the C-R relationship? Furthermore, there should be some discussion not only of the lower bound of the CI, but also of the upper bound. This would be consistent with the statutory mandate that the standard allow an "adequate margin of safety" that are "requisite to protect the public health."

The Schartz et al. 2008 Figure 2 would be useful.

Different statistical metrics: The assessment provides two alternatives referred to as the composite monitor and the maximum monitor. On the top of page 2-61, the text is a bit unclear but appears to be stating that, for the same air quality domain, the composite monitor concentrations are less than

those based on the maximum monitor approach. An argument is made that an approach based on composite monitors has a “margin of safety” compared to the maximum monitor perspective. An implication is that if the maximum monitor approach is used, then data from epidemiological studies should be selected that are based on significant lower annual average concentrations. However, a judgment is made that data should be selected from the epidemiological studies for which the C-R relationships are “strongest.” A judgment is made that concentrations not more than one standard deviation below the long-term mean concentration should be used. Although it is reasonable to make some kind of judgment such as this, the judgment should be explained. For example, it is not clear as to why one standard deviation was chosen, and not, say, 1.65 standard deviations, 1.96 standard deviations, and so on. For example, the information given in Table 2-4 implies that there are both author reported and EPA analyzed air quality data well below the “Mean-1SD”

Figures 2-7 through 2-8 provide useful information regarding the frequency distribution of annual mean concentrations. The lower panel of each figure is a bit unclear, but seems to be a population weighted version of the same air quality data. However, the sample sizes in the lower panels appear to be different than those in the upper panel, which should be explained.

The text is somewhat confusing to the reader. For example, it is not clear as to why the lower bound to be considered is a range from the 10th to 25th percentiles, as opposed to, say, the 10th percentile alone. In figure 2-7, for long-term exposure studies, the upper panel, the 10th percentile annual mean concentrations range from approximately 9 to 11 ug/m<sup>3</sup>. The population weighted values are 10 to 13 ug/m<sup>3</sup>. In both cases, the upper bounds of these ranges are for the high site, and the lower bounds are for the composite monitor.

It is not clear to the reader that a standard deviation is any more or less arbitrary than a specific percentile of a frequency distribution, contrary to the text on page 2-65, lines 20-23.

A key point is made on page 2-68, lines 7-16, which seems to need more discussion, and needs to be discussed in the previous section regarding confidence intervals on the C-R relationships. A key point to make clearly is regarding what is the lowest long-term ambient concentration and the lowest short-term ambient concentration at which statistically significant effects are observed, and, furthermore, what are the lowest long-term and short-term concentrations at which positive, even if not statistically significant, effects are observed.

The discussion of sensitive groups is very important. However, this material would seem to be a more appropriate fit in the section on confidence intervals.

In general, this section of the report is somewhat confusing to the reader, because the key consideration should be to select ambient concentrations at which adverse effects are observed, taking into account the statutory mandate to provide an adequate margin of safety. Much of this text seems to focus on what range of air quality data were the basis of the epidemiological study, but without an adequate tie-in to whether there are health effects associated with such concentrations. For example, page 2-72, paragraph of lines 6 to 14, the basic argument here is unclear. What is the “evidence” to support these numbers? Is the idea simply that the levels should not be chosen to be lower than approximately the 10th percentile of ambient concentrations observed in the epi studies? If so, then the text of this section could be shortened considerably.

If the maximum monitor approach is ultimately deemed to be less useful, then perhaps it need not be included in the document.

b. Potential alternative annual standard levels based on composite monitor distributions versus maximum monitor distributions:

First, it is not at all clear as to why the annual standard should be “generally controlling.” The NAAQS should provide health protection for both long-term and short-term health effects. It is not clear, for example, as to why the 24-hour level should be at least 2.5 times higher than the annual standard. Such a statement seems to be independent of consideration of health effects. A statement is made on page 2-73, lines 26-27 that “based on this consideration” consideration should be given to retaining the 35 ug/m<sup>3</sup> 24-hr level in conjunction with annual standards of 13 to 11 ug/m<sup>3</sup>. Setting aside the math problem here (e.g.,  $11 * 2.5 = 27.5$ , not 35), the rationale here does not appear to be based on health effects, and thus appears not to be valid.

While it is useful to have insight as to what combinations of annual and 24 hour levels would lead to the annual standard being controlling in a given area, it is not clear why the policy objective should be set both levels such that the annual standard is generally controlling.

c. Use of risk information in informing staff conclusions on alternative annual and 24-hour standard levels, including approaches used to assess overall confidence and potential bias in the risk estimates?

There is a disconnect between the evidence-based section and the risk-based section that is confusing to the reader. The “evidence-based” section reaches the conclusion that alternative levels to be considered should be 11 to 13 ug/m<sup>3</sup> for the annual standard and 35 ug/m<sup>3</sup> for the 24-hour standard, and also a combination of 11/30 for the annual/24-hour levels. However, the risk-based analysis does not systematically evaluate these combinations, omitting the 11/35 and 11/30 combinations. Furthermore, the text implies that a 10/35 case was analyzed, but no results are reported.

The results of the risk assessments are presented mainly in terms of percentage risk reduction compared to the current standard, in Figures 2-11 and 2-12 for long-term and short-term effects, respectively. While this is useful information, it is not relevant to the setting of a NAAQS. The goal of NAAQS is not to achieve relative risk reduction, but to protect public health with an adequate margin of safety. Thus, the risk characterization should be based on absolute rather than relative numbers (e.g., number of premature deaths estimated under each scenario). Therefore, much of the text needs to be revised.

This section should not only focus on the best estimate of risk, but the confidence intervals and non-quantified sources of bias, such as SES. See also Page 2-35, lines 10-12, which indicates that sensitivity analysis of model specification used in the the risk assessment produce risk estimates that are a factor of 2 to 3 higher than the core risk estimates.

In cases where the 24-hour level would be controlling, it may be the case that there is less confidence in the risk characterization for the annual level. However, this in and of itself is not a reason as to why the 24-hour standard should not be controlling in such cases. A key policy question is whether having a 24-hour level be controlling in these cases protects public health with an adequate margin of safety.

d. Staff's conclusion that alternative annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$  are most strongly supported by the available evidence and risk-based information?

Section 2.3.4.3 concludes that is appropriate to set levels so that the annual standard is generally controlling. However, it is not clear to the reader as to how this conclusion was reached.

A conclusion is made that alternative annual standards ranging from 13 to 11  $\text{ug}/\text{m}^3$  are appropriate to consider. For internal consistency, a reason should be given as to why a level of 14  $\text{ug}/\text{m}^3$  is not appropriate to consider. A level of 14/35 was considered in the risk assessment. Thus, the reader may wonder why this is set aside in the staff conclusions.

A conclusion is made to the effect that consideration should be given to retaining the 24-hour level of 35  $\text{ug}/\text{m}^3$  or to having a 30  $\text{ug}/\text{m}^3$  level "particularly" in combination with an annual level of 11  $\text{ug}/\text{m}^3$ . It is not clear as to how this conclusion was reached, or why other combinations such as 13/30, 12/30, or 11/25 would not also be useful to consider.

The assessment is weakened by not having a quantitative risk assessment result for the 11/35 and 11/30 levels, or possibly for other combinations as noted above.

There should be discussion of potential sources of biases in the risk characterization, such as the role of differences in distributions of low SES groups represented in the epidemiological studies versus in the urban populations being analyzed.

e. Staff's approach of focusing on peak-to-mean ratios to inform the level of a 24-hour standard that would provide supplemental protection to a generally controlling annual standard?

The key consideration should be the health effects evidence, rather than the peak-to-mean ratios. The ratios are useful in providing insight as to whether the annual or 24-hour standard would be controlling in a particular area, but it is not clear as to why the annual standard should be generally controlling.

f. Staff's conclusion that consideration should be given to retaining the current 24-hour standard level of 35  $\mu\text{g}/\text{m}^3$  in conjunction with annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$ , and that consideration could also be given to an alternative 24-hour standard level of 30  $\mu\text{g}/\text{m}^3$  particularly in conjunction with an annual standard level of 11  $\mu\text{g}/\text{m}^3$ ?

This point is addressed above.

Charge Question 4: Key Uncertainties and Areas for Future Research and Data Collection (section 2.5): What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?

Response: The material presented here is generally reasonable. It would be nice to have all of this information to support future assessments.

A few additional points to mention are:

- Need for activity data to support probabilistic scenario-based exposure models, such as additional activity diary data to incorporate into the Consolidated Human Activity Database (CHAD)
- Characterization of indoor exposures to PM of ambient origin. For example, the penetration of ambient PM<sub>2.5</sub> and PM<sub>10</sub> into indoor microenvironments (home, work, school, restaurant, bar, vehicle) should be better characterized, particularly taking into account differences in penetration with respect to particle size and composition.
- How might climate change affect the size distribution and composition of PM in the PM<sub>10</sub>, PM<sub>2.5</sub>, and UFP ranges?

What is lacking in this section is an idea of priorities. What is outlined here is a very broad and ambitious research agenda. It would help to start this section with a prioritized review of key uncertainties, in order to help establish priorities among the suggested research topics.

Charge Question 10: Key Uncertainties and Areas for Future Research and Data Collection (section 3.5): What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?

Response:

See comments on Chapter 2.

The key distinction for this chapter is the need to seriously focus on PM<sub>10-2.5</sub> for both mass and composition. The CASAC looks forward to the planned implementation of monitors that measure PM<sub>10-2.5</sub>, rather than PM<sub>10</sub>. There is a critical need for national monitoring data on PM<sub>10-2.5</sub> in order to provide a basis for epidemiological studies that focus on this size fraction. Furthermore, there is a need for speciated data to support health effects estimates. Spatial and temporal variability in coarse particle mass and composition need to be characterized. In addition, the national monitoring data will support a baseline for ambient air quality in order to compare with health effects data in order to assess whether there is a need for a standard.

The research areas described in the draft Section 3.5 are reasonable, but there needs to be strong emphasis on the critical need for coarse PM data, in order that the NAAQS can move beyond PM<sub>10</sub> as an indicator for coarse PM in a future revision.

Another question to be considered is regarding what size cut-points are appropriate, and also regarding what specific components are of most interest or concern with respect to health effects.

There is a need for continuous monitoring of coarse PM (and of PM<sub>2.5</sub>) in order to support health effects studies and to be able to assess alternative forms of possible future standards.

Other challenges for future research: (a) it may be difficult to get useful data from rodent studies since they can breathe particles only up to about 4 to 5 microns; (b) getting good chemical characterization of the particles will be a problem, since there are primary biological materials.

Prioritization is needed, such as via a separate meeting or workshop.

**Dr. Joseph J. Helble**

The Second Draft Policy Assessment is much more concise and readable than was the earlier draft. Text has been removed and replaced with appropriate references to the ISA and other documents, and there is little overlap between sections. The length and clarity of this document are now, in my view, appropriate for this Policy Assessment.

*Charge Question 12: Nature of the Indicator (section 4.3. 1): What are the Panel's views on the following:*

*a. Staff's consideration of the three indicators identified in this section and our conclusions on the appropriateness of these indicators for consideration in this review?*

The three indicators – mass, direct measurement of extinction, and calculated extinction based on speciation and size data – are the three relevant indicators. Given the dependence of extinction on particle composition, the conclusions regarding the relative inadequacy of a PM mass-only standard are appropriate. Direct measurement of extinction is, of course, a direct measurement and relevant, and the reasonable match of the calculations based on speciated PM mass suggests that this latter indicator is also appropriate.

*b. The development and evaluation of a new approach that is based on using speciated PM2.5 mass and relative humidity to calculate PM2.5 light extinction by means of the IMPROVE algorithm?*

Appropriate, as noted above. As discussed in the research needs section of the PA, better understanding of speciated PM2.5 mass distributions is needed.

*c. The assessment approach and results comparing the PM components that contribute to the hours selected in the top percentiles for PM2.5 mass and PM10 light extinction?*

The assessment approach, looking at contributions to PM mass v. contributions to PM light extinction under different scenarios, is appropriate, as are the conclusions extracted from the study. My only comment is that the figures in Appendix 4C are difficult to read, the text used to describe each part isn't particularly clear, and it appears that the captions of the relevant figures may be mislabeled (for example, in each figure, it seems that extinction is presented in parts a and d, *not* a and b – PA text is correct, figure caption is not)

*Charge Question 14: Key Uncertainties and Areas for Future Research and Data Collection (section 4.5): What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?*

The major areas of research and data collection needed to address key uncertainties related to a visibility-based secondary standard are nicely captured in Section 4.5 of the PA. The section appropriately identifies two major areas of need, one related to visibility preference, and one related to methods of measurement.

In the first category, preference studies, the details noted by EPA all identify a strong need for additional urban visibility preference studies conducted using consistent methodology. The range of 50% acceptability values discussed as possible standards are based on just four studies (Figure 4-2), which, given the large spread in values, provide only limited confidence that the benchmark candidate protection levels cover the appropriate range of preference values. Studies using a range of urban scenes (including, but not limited to, iconic scenes – “valued scenic elements” such as those in the Washington DC study), should also be considered.

In the second category related to methods of measurement, I support the proposal to conduct studies in several cities, pairing direct monitoring of light extinction with enhanced monitoring of PM size and composition distributions (i.e. continuous PM speciation monitoring). Additional work should also be conducted to understand the contribution of PM<sub>10-2.5</sub> in southwestern areas other than Phoenix, to address the lack of information for scattering associated with this fraction of PM<sub>10</sub> as is noted on page 4-30.

Underlying this overall discussion is a clear need for better particle size – composition distribution information (i.e. particle composition distributions as a function of particle size). It is addressed in different ways in the discussions of future research needs elsewhere in the PA (Sections 2.5 and 3.5), and the development of continuous monitoring methods for specific PM components addressed in Section 2.5 is equally applicable here. Improved understanding of size-dependent PM composition would also help address some of the questions related to the role of scattering and absorbing aerosols in climate forcing that are raised in PA Section 5.2.4.

Minor ed. Comments:

- p. 2-89, line 16, missing “to” between “models” and “expand” ?
- p. 4-13, line 25: “effects” is vague. Degradation would be a clearer term here.
- p. 4-19, line 16, ) needed after “screen”
- p. 4-33, line 33, delete “, and simplicity” since the text is already describing “a simpler approach”
- p. 4-35, line 15, first word, change “show” to “shown”
- p. 4-36, line 15, insert of between “because” and “the differing”
- p. 4-39, line 9, delete second period at end of sentence
- p. 4-41, line 3, change “areas” to “area”
- p 4-46, line 2 delete apostrophe
- p. 4-51, line 19, insert “data” between “component” and “to calculate”
- p. 5-5, line 3, delete comma
- p. 5-15, line 32, “review” ? – wouldn’t “policy assessment” be correct here?

**Dr. Rogene Henderson**

Answer to charge questions assigned to me:

1. Current Approach (section 2.1.3):

a. What are the Panel's views on the staff's approach to translating the available epidemiological evidence, risk information, and air quality information into the basis for reaching conclusions on the adequacy of the current standards and on alternative standards for consideration?

The Panel agrees with the approach as described in section 2.1.3 and appreciates the clarity with which the approach was described. The overview of the approach presented in Figure 2-1 is well-organized and clear. The Panel agrees that it is appropriate to go back to the approach used in 1997 to consider the annual and 24 hr standards together, with the annual standard as the controlling standard and the short-term standard intended to supplement the protection afforded by the annual standard. The Panel supports the Agency's consideration of evidence-based and risk-based information as well as the uncertainties associated with both types of information. The Panel considers it appropriate to place the greatest emphasis on health effects judged to be causal or likely causal in the analysis presented in the ISA.

b. Has staff appropriately applied this approach in reviewing the adequacy of the current standards (section 2.2) and potential alternative standards (section 2.3)?

The staff has followed this approach in reviewing the adequacy of the current standards and in considering potential alternative standards. The outline of the text of section 2.3 follows the outline presented in the overview of the approach given in Figure 2-1.

6. Adequacy of the Current PM10 Standard (section 3.2): What are the Panel's views on the alternative approaches presented for considering the evidence and its uncertainties as they relate to the adequacy of the current standard?

Section 3.2 is exceptionally well written. It includes a discussion of the studies that are most significant for the question for the adequacy of the current standard. At the end, the authors offer two different approaches to analysis of the studies. The information on the new studies related to coarse particles indicated differences in the robustness of the responses that left the answer to the question of adequacy of the current standard uncertain. Therefore it was helpful to have the descriptions of two approaches to analysis of the data, as given at the end of the section.

Rogene Henderson  
July 15, 2010

General comment on 2nd draft PA:

I think this is a much-improved draft PA; the Agency has been responsive to the previous comments of CASAC.

Answers to other charge questions:

## Chapter 2 (Primary Standards for Fine Particles)

### 1. Current Approach (section 2.1.3):

a. What are the Panel's views on the staff's approach to translating the available epidemiological evidence, risk information, and air quality information into the basis for reaching conclusions on the adequacy of the current standards and on alternative standards for consideration?

Good approach.

b. Has staff appropriately applied this approach in reviewing the adequacy of the current standards (section 2.2) and potential alternative standards (section 2.3)?

Yes.

### 2. Form of the Annual Standard (section 2.3.3.1):

a. What are the Panel's views on the additional analyses conducted to characterize the potential for disproportionate impacts on susceptible populations, including low income groups and minorities associated with spatial averaging allowed by the current annual standard?

Well done

b. In light of these analyses, what are the Panel's views on staff's conclusion that the form of the annual standard should be revised to eliminate spatial averaging?

Agree.

### 3. Alternative Levels (section 2.3.4): What are the Panel's views on the following:

a. The insights that can be gained into potential alternative standard levels by considering:

i. Confidence bounds on concentration-response relationships?

ii. Different statistical metrics that characterize air quality distributions from multi-city epidemiological studies?

I agree with the discussion of these topics in the text.

b. Potential alternative annual standard levels based on composite monitor distributions versus maximum monitor distributions?

I agree with the policy to focus on alternative levels that are just somewhat below the long-term mean concentrations reported in the epidemiological studies using the composite monitor distributions.

c. Use of risk information in informing staff conclusions on alternative annual and 24-hour standard levels, including approaches used to assess overall confidence and potential bias in the risk estimates?

This was well done.

d. Staff's conclusion that alternative annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$  are most strongly supported by the available evidence and risk-based information? I agree.

e. Staff's approach of focusing on peak-to-mean ratios to inform the level of a 24-hour standard that would provide supplemental protection to a generally controlling annual standard?

I agree.

f. Staff's conclusion that consideration should be given to retaining the current 24-hour standard level of 35  $\mu\text{g}/\text{m}^3$  in conjunction with annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$ , and that consideration could also be given to an alternative 24-hour standard level of 30  $\mu\text{g}/\text{m}^3$  particularly in conjunction with an annual standard level of 11  $\mu\text{g}/\text{m}^3$ ?  
Agree.

4. Key Uncertainties and Areas for Future Research and Data Collection (section 2.5):

What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?

I have nothing to add.

Chapter 3 (Primary Standard for Coarse Particles)

5. Current Approach (sections 3.1.4, 3.2, 3.3):

a. What are the Panel's views on the approach to translating the available evidence and air quality information into the basis for reviewing the coarse particle standard?

I agree with the approach.

b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 3.2) and potential alternative standards (section 3.3)?

Yes.

6. Adequacy of the Current PM10 Standard (section 3.2): What are the Panel's views on the alternative approaches presented for considering the evidence and its uncertainties as they relate to the adequacy of the current standard?

I liked the presentation of the two approaches for consideration of the data.

7. Indicator (section 3.3.1): What are the Panel's views on the approach taken to considering standard indicator and on staff's conclusion that PM10 remains an appropriate indicator in this review?

I agree with the staff conclusions.

8. Form (section 3.3.3): What are the Panel's views on the approach taken to considering the form of the standard and on staff's conclusion that revising the form to a 98th percentile form would be appropriate for a 24-hour PM10 standard meant to protect against exposures to thoracic coarse particles?

I agree.

9. Level (section 3.3.4): What are the Panel's views on the following:

a. The approach taken by staff to identify potential alternative PM10 standard levels, in conjunction with a 98th percentile form, including the weight placed on different studies? OK.

b. Staff's conclusion that the evidence most strongly supports standard levels around 85  $\mu\text{g}/\text{m}^3$ ?

I agree.

c. The alternative approach to considering the evidence that could support standard levels as low as 65  $\mu\text{g}/\text{m}^3$ ?

I do not agree with this low a level because it places more weight on studies in which results were positive but not statistically significant.

10. Key Uncertainties and Areas for Future Research and Data Collection (section 3.5):

What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?

I have nothing to add to this section.

## Dr. Morton Lippmann

The 2<sup>nd</sup> Draft PM PA is a great improvement over the first. OAQPS Staff was very responsive to the CASAC comments and recommendations on the first draft, and deserves to be commended for producing a clearly readable exposition of the scientific basis for its conclusions, as well as clearly stated rationales for its recommendations.

I could only generate a relatively small number of specific suggestions for edits and/or changes for Chapters 2 and 3, which are enumerated below.

### Page Line Comment

2-23	10	change “found” to “continued to find”.
2-23	17	insert a comma after “studies” and insert “the increased” before “risk”.
2-32	14	insert a definition of “peakiness”. Does it have a specific meaning in the context of this document? If so, what is it?
2-34	23,25	change “which” to “that”.
2-36	2	add to end of sentence: “but give greater weight to eastern and Midwestern populations.”
2-43	18	insert “and toxicological” after “epidemiological”.
2-44	20	insert “and humidity” after “concentrations”.
2-45	8	insert “collective” before “surface”.
2-45	21	change “i.e.,” to “within the”.
2-86	21	add to end of sentence: “, and will be the subject of a future document”.
2-87	27	change “ <u>Exposure-related Factors.</u> ” to “ <u>Factors Influencing Exposures.</u> ”
2-89	1	change “Children” to “Age”, and add “and older adults” after “children” at end of the line.

### Charge Questions:

#### **Chapter 2 (Primary Standards for Fine Particles)**

##### **1. Current Approach (Section 2.1.3):**

**a. What are the Panel’s views on the staff’s approach to translating the available epidemiological evidence, risk information, and air quality information into the basis for reaching conclusions on the adequacy of the current standards and on alternative standards for consideration?**

The approach is sound.

**b. Has staff appropriately applied this approach in reviewing the adequacy of the current standards (section 2.2) and potential alternative standards (section 2.3)?**

Yes.

##### **2. Form of the Annual Standard (Section 2.3.3.1):**

**a. What are the Panel’s views on the additional analyses conducted to characterize the**

**potential for disproportionate impacts on susceptible populations, including low income groups and minorities associated with spatial averaging allowed by the current annual standard?**

They were well conceived and well articulated.

**b. In light of these analyses, what are the Panel's views on staff's conclusion that the form of the annual standard should be revised to eliminate spatial averaging?**

The conclusion was well justified.

**3. Alternative Levels (Section 2.3.4): What are the Panel's views on the following:**

**a). The insights that can be gained into potential alternative standard levels by considering:**

**i. Confidence bounds on concentration-response relationships?**

Useful, and an appropriate choice.

**ii. Different statistical metrics that characterize air quality distributions from multi-city epidemiological studies?**

Useful, and highly appropriate for the purpose.

**b). Potential alternative annual standard levels based on composite monitor distributions versus maximum monitor distributions?**

The composite monitor approach is preferable because of its stability.

**c). Use of risk information in informing staff conclusions on alternative annual and 24-hour standard levels, including approaches used to assess overall confidence and potential bias in the risk estimates?**

The risk information provides valuable insights, and should be used in drawing conclusions.

**d). Staff's conclusion that alternative annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$  are most strongly supported by the available evidence and risk-based information?**

The rationale for the conclusion was well developed, and well justified.

**e). Staff's approach of focusing on peak-to-mean ratios to inform the level of a 24-hour standard that would provide supplemental protection to a generally controlling annual standard?**

The approach is sound.

**f). Staff's conclusion that consideration should be given to retaining the current 24-hour standard level of 35  $\mu\text{g}/\text{m}^3$  in conjunction with annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$ , and that consideration could also be given to an alternative 24-hour standard level of 30  $\mu\text{g}/\text{m}^3$  particularly in conjunction with an annual standard level of 11  $\mu\text{g}/\text{m}^3$ ?**

The conclusions are reasonable in relation to the criteria established by the Clean Air Act (CAA), and those developed by the OAQPS Staff that have been endorsed by CASAC.

The choices within these options will need to be based on the Administrator's interpretation of the CAA's requirement for a margin-of-safety. In other words, in the absence of response thresholds, how much public health impact resulting from exposure to ambient air  $\text{PM}_{2.5}$  is acceptable under the CAA.

The least protective option (35-13) would provide significant additional public health benefits in most of the U.S., in comparison to the current limits (35-15), and these benefits would be greatest in the more humid parts of the U.S. The most protective option (30-11) would provide significant additional public health benefits to a larger part of the U.S. population in comparison to the current limits (35-15) and any of the intermediate options, but would not prevent at least some adverse health effects among the most susceptible segments of the population.

The decision to be made on the selection among the alternative levels for the PM<sub>2.5</sub> NAAQS will need to be made judiciously, with acknowledgment of its public health consequences. As compared to the previous round for PM, it is no longer justifiable to rely on residual uncertainties as a basis for confronting the need for a significant advance in public health protection.

**4. Key Uncertainties and Areas for Future Research and Data Collection (Section 2.5): What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?**

The key uncertainties and areas for future research and data collection are well summarized in Section 2.5. The acknowledgement (at the top of page 2-87) that "Much of this research may depend on the availability of increased monitoring data" is apt and appreciated. The opportunities for epidemiological research to effectively address the knowledge gaps on the effects, and concentration-response relationships, of PM components and source-related mixtures cannot be achieved without additional monitoring data to provide PM speciation and better temporal and spatial resolution. Only EPA can provide the impetus and support for such an enhancement in air quality monitoring.

The research needs to address uncertainties in health outcomes, exposure durations of concern, and susceptible populations that are also very nicely outlined are well targeted, and can be effectively studied in human populations. Such studies, to be most productive, will need the enhanced monitoring data that EPA has recognized as being needed, and that only EPA can provide.

**Chapter 3 (Primary Standard for Coarse Particles)**

**5. Current Approach (sections 3.1.4, 3.2, 3.3):**

**a. What are the Panel's views on the approach to translating the available evidence and air quality information into the basis for reviewing the coarse particle standard?**

The Staff has done a good job of describing a suitable, evidence-based, approach for translating the limited amount of relevant health effects evidence and air quality information in different U.S. regions into a basis for reviewing the adequacy of the current coarse particle standard.

**b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 3.2) and potential alternative standards (section 3.3)?**

Yes.

**6. Adequacy of the Current PM<sub>10</sub> Standard (section 3.2): What are the Panel's views on the alternative approaches presented for considering the evidence and its uncertainties as they relate to the adequacy of the current standard?**

They remind us of the reliance on uncertainties used by the previous Administrator as an excuse to

discount the increasing evidence that exposures to thoracic coarse PM increases health risks.

**7. Indicator (section 3.3.1): What are the Panel's views on the approach taken to considering standard indicator and on staff's conclusion that PM10 remains an appropriate indicator in this review?**

The document makes a good case for retaining PM<sub>10</sub> as an indicator for this round of review.

**8. Form (section 3.3.3): What are the Panel's views on the approach taken to considering the form of the standard and on staff's conclusion that revising the form to a 98th percentile form would be appropriate for a 24-hour PM10 standard meant to protect against exposures to thoracic coarse particles?**

The document makes a good case for using the 98<sup>th</sup>% form for this round of review.

**9. Level (section 3.3.4): What are the Panel's views on the following:**

a. The approach taken by staff to identify potential alternative PM10 standard levels, in conjunction with a 98th percentile form, including the weight placed on different studies?

The approach outlined is a very reasonable one, and appropriate weights were given to the available studies.

**b. Staff's conclusion that the evidence most strongly supports standard levels around 85 µg/m<sup>3</sup>.**

This conclusion is not appropriate, insofar as it is based on an average equivalence of PM<sub>10</sub> at 150 µg/m<sup>3</sup> for the 4<sup>th</sup> highest concentration in 3 years, and 85 µg/m<sup>3</sup> for the 98<sup>th</sup> %<sup>ile</sup>. Because of the well-documented differences in "peakiness" and the ratios of PM<sub>2.5</sub> to PM<sub>10</sub> in different parts of the U.S., there will be a less protective limit for parts of the U.S. The absence of data on the adequacy of the present PM<sub>10</sub> NAAQS to protect against the adverse effects of PM<sub>10-2.5</sub> does not provide a basis for relaxing the thoracic coarse PM NAAQS for parts of the U.S.

**c. The alternative approach to considering the evidence that could support standard levels as low as 65 µg/m<sup>3</sup>?**

The presentation of the evidence, as summarized in the text beginning on line 33 of page 3-42 is convincing, at least to this CASAC Panel reviewer, that a PM<sub>10</sub> level below 85 µg/m<sup>3</sup> is warranted, and a range of 75 to 65 µg/m<sup>3</sup> should be recommended for consideration.

**10. (Section 3.5): Key Uncertainties and Areas for Future Research and Data Collection  
What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?**

The brief statement of the key uncertainties and areas for future research and data collection in Section 3.5 is very much on target, with one exception. That one is: "Animal toxicological studies of long-term exposures (i.e., months to years) to PM<sub>10-2.5</sub> would be useful", as stated on page 3-46, lines 37 & 38. However, inhalation exposures are not feasible in rodents because nearly all particles <2µm would deposit in the nasal airways, and not penetrate into the lung parenchyma, and those few that did would not have much deposition in the tracheobronchial airways. Exposure studies in animals by other routes of administration would have severe limitations in terms of interpretation and risk assessment.



**Dr. William Malm**

The current draft PM PA is much improved over the first. EPA staff was for the most part responsive to CASAC recommendations. However, a few significant issues remain as outlined below.

**11. Current Approach (section 4.1.3):**

a. What are the Panel's views regarding our approach for translating technical evidence and assessment results into the basis for assessing current fine particle standards and considering alternative standards to provide protection against PM-related visibility impairment?

The combined evidence- and impact-based review nicely contrasts various approaches and metrics for protecting urban visibility. The three indicators; PM<sub>2.5</sub> extinction, reconstructed extinction, and mass concentration, pretty much cover the currently available metrics that could be used to set a standard. Averaging times are considered, as are various percentile levels for both extinction and mass concentration. The various metrics are compared to VAQ acceptability studies that were carried out in four urban areas.

Detailed analysis was only presented for a subset of percentile levels and 1-hr daily maximum levels versus maximums for all days. It is clear that contrasting and comparing all combinations would be overwhelming; however, the selection of a 90<sup>th</sup> percentile for 1-hr maximum and a 98<sup>th</sup> percentile criteria for all daylight hours is not well justified, other than the two approaches yield similar results. It would be helpful to develop an easily understood statistic for each comparison, and then extend the contrasts and comparisons to more combinations of the percentile levels, metric forms, and maximum selections.

The EPA is to be commended for taking the VAQ acceptability studies and applying the logit digit model to the results in such a way as to more directly intercompare the four studies and estimate various visibility acceptability levels. It would be of interest to further expand the analysis, using existing data, to see if there is a visibility index that represents visibility conditions independent of the type of scene being viewed, such that preference levels for all studies, when plotted against this index, would all yield the same response curve. If such an index could be identified, the currently available studies could be used to assess visibility levels in any urban area or setting, using this index. The relationship of this index to  $dv$  or extinction will necessarily be nonlinear; however, this approach would allow representative extinction levels to be examined for a variety of urban areas and/or landscape/urbanscape features.

In any case, I think the approach taken very clearly shows the limitations of using the current PM<sub>2.5</sub> standards to protect against visibility impairment judged to be unacceptable by available VAQ acceptability studies.

b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 4.2) and potential alternative standards (section 4.3)?

For the most part they have.

**12. Nature of the Indicator (section 4.3.1):** What are the Panel's views on the following:

a. Staff's consideration of the three indicators identified in this section and our conclusions on the appropriateness of these indicators for consideration in this review?

The three indicators, mass, reconstructed extinction, and measured extinction, are appropriate indicators. However, it would be of interest to further expand the analysis, using existing photos and preference data, to see if there is a visibility index that represents visibility conditions independent of the type of scene being viewed, such that preference levels for all studies, when plotted against this index, would all yield the same response curve. If such an index could be identified, the current available studies could be used to assess visibility levels in any urban area or setting. The relationship to  $dv$  or extinction will necessarily be nonlinear; however, this approach would allow representative extinction levels to be examined for a variety of urban areas and/or landscape/urbanscape features.

b. The development and evaluation of a new approach that is based on using speciated PM<sub>2.5</sub> mass and relative humidity to calculate PM<sub>2.5</sub> light extinction by means of the IMPROVE algorithm?

It has been demonstrated in many studies that it is possible to reconstruct extinction from speciated mass data if the relative humidity is known. The EPA has further demonstrated that, in most cases, applying monthly average speciated mass data to hourly mass measurements and applying the IMPROVE algorithm results in a similar estimate of hourly extinction values as would have been obtained by using the hourly speciated data directly.

c. The assessment approach and results comparing the PM components that contribute to the hours selected in the top percentiles for PM<sub>2.5</sub> mass and PM<sub>10</sub> light extinction?

See comments in 11a and 13a. A quantitative statistical index, representative of the good or not so good comparison between approaches, should be developed.

**13. Alternative Levels and Forms (section 4.3.3):** What are Panel views on the following:

a. The performance assessment which focused on the Candidate Protection Levels of 64, 112, 191 Mm<sup>-1</sup> for PM<sub>2.5</sub> light extinction and speciated PM<sub>2.5</sub> mass-calculated light extinction, and alternative levels of 10, 20, and 30  $\mu\text{g}/\text{m}^3$  for PM<sub>2.5</sub> mass concentration?

These are appropriate CPL and PM<sub>2.5</sub> levels. The CPL values were based on all visibility preference data that are available and bound the study results as represented by the 50% acceptability criteria. However, I think it would be worth it, but not necessarily essential, to expand some of the tables to include 10 and 40  $dv$  values, in that at 10  $dv$ , not anybody found the scene to be unacceptable, and at 40  $dv$ , virtually everybody found the all scenes to be unacceptable. What would these  $dv$  levels correspond to in the context of PM<sub>2.5</sub> and the various percentile levels?

b. Use of three-year averaged 90th and 95th percentiles in conjunction with a 1-hour daily maximum form and use of three-year averaged 98th percentile in conjunction with the all daylight hours form?

These levels may very well be appropriate; however, I don't think they were well justified. It seems that the cursory argument was that the 90–95<sup>th</sup> percentiles in conjunction with the 1-hr daily maximum identified similar days and hours of violation, as did the 98<sup>th</sup> percentile in conjunction with all daylight hours, and this correspondence was reason enough to pick these two approaches. I think it would be informative to do all, or at that least the same, percentiles for both all days and daily max hr, contrast and compare the approaches, and then try to develop a self consistent argument of why one approach would be better than another. It doesn't seem that this was done. The question of the implications of which sources might be identified as problematic as a function of all hours all days versus daily max hr has still not been adequately addressed. It was pointed out that the all hour, all day in some cases selected out multiple hours on the same day. It seems that a significantly extended episode of low visibility might be attributed to a single source, such as a large wildfire or prescribed fire, which would result in the all hour, all day approach targeting only one large emission episode that occurred for only one or a few time periods.

c. Insights to be drawn by comparing the PM components for hours included among the 10% highest for a 1-hour daily maximum form with the hours included among the 2% highest for an all daylight hours form, for the various indicators considered (Appendix C)?

See comments above. These two approaches appear to be similar; however, it would be helpful to quantify the similarities as opposed to a qualitative discussion. Maybe a scatter plot for the 14 sites of the average fractional contribution of a species as a function of the various approaches and some way of showing which days are selected in the context of all other days would be useful—some way of gaining insight into the kinds of visibility episodes that get selected.

#### **14. Key Uncertainties and Areas for Future Research and Data Collection (section 4.5):**

What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?

Under "Visibility Preference". I repeat my comments under 11a. It would be of interest to further expand the analysis, using existing data, to see if there is a visibility index that represents visibility conditions independent of the type of scene being viewed, such that preference levels for all studies, when plotted against this index, would all yield the same response curve. If such an index could be identified, the current available studies could be used to assess visibility levels in any urban area and setting, using this index. The relationship of this index to  $dv$  or extinction will necessarily be nonlinear; however, this approach would allow representative extinction levels to be examined for a variety of urban areas and/or landscape/urbanscape features.

Under "Urban Visibility Conditions". There isn't any discussion of the role that clouds or atmospheric conditions might play in peoples' visibility preferences as a function of PM. Visibility conditions associated with sky color and clouds could very well be significant normalizing features, making many or most urban settings similar. Any new visibility effects assessments should include a variety of atmospheric conditions other than clear skies, as was used in the current studies.

Some specific comments:

Page 4.5: *“The 2005 Staff Paper noted that a standard set at any specific PM<sub>2.5</sub> concentration would necessarily result in visual ranges that vary somewhat in urban areas across the country, reflecting the variability in the correlations between PM<sub>2.5</sub> concentrations and light extinction.”* More than just correlations – the slope of the line between PM<sub>2.5</sub> and visual range will also vary.

Page 4.13, line 18: One could use a more up to date f(RH) curve in conjunction with the IMPROVE algorithm and “improve” the equation significantly.

Line 35: The “refinements” in the IMPROVE algorithm reflect more than just the aging of organic aerosols. Might want to discuss the change in Roc and size distribution shifts of both OC and inorganic carbon as a function of aging.

Page 4.17, line 17: *“These combine to make early morning the most likely time for peak urban visibility impacts.”* Probably sun angle is as important as or more important than the atmospheric variables mentioned. Include discussion of sun angle effects – forward/back scatter, illuminated and shadowed scenes, etc.

Page 4.18, 1<sup>st</sup> paragraph: See comments under 11a. Here is where you could have a discussion of scene-specific indices that characterize observers’ response functions. For example, such variables as modulation depth, JNCs, average contrast, and so forth. Then relate these variables to the modulation transfer function of the atmosphere and, ultimately, extinction. This would show how scene characteristics and illumination in conjunction with extinction contribute to preference.

Line 11: Atmospheric mixing characteristics were also held constant. None of the studies addressed non-uniform haze, such as layered hazes.

Page 4.24, lines 10–12: It would be helpful to, at times, point out when real data is being used versus modeled information.

Page 4.35, line 34: *“...we believe...”* There is no room for using words like belief in a scientific document. A belief is not an adequate justification for any decision point! It is also bothersome to read *“...sufficiently similar results...”* – especially in the context of “belief” to justify an analysis approach. Quantify the concept!

Page 4.36: The general discussion around the figures in 4C are difficult to follow primarily because the captions and axes in the figures are so small they cannot be easily read. Figures need to be improved and a clear and complete description of these figures would be helpful before the discussion points.

Page 4.37: *“While perception of change in visibility can occur in less than a minute, meaningful changes to path averaged light extinction occur more slowly and can be well represented by hourly averaging.”* This may very well be true, but I think it is

conjecture.. I haven't seen any evidence in the literature for making this statement, certainly not in the absolute way that it is stated. I am not sure this argument is adequate justification for a 1-hr averaging time.

Page 4.39, lines 18-28: What are the emission control strategy implications of this discussion? If not here, I would think a discussion of what sources might be preferentially controlled as a function of regulation form and type would be appropriate.

Page 4.40: *"We noticed a close correspondence..."* Here, and throughout the document, there are a number of qualitative statements such as this. What is a close correspondence? Make it quantitative. A close correspondence means different things to different people. Some would say a correlation of 0.5 constitutes a close correspondence, while others might make this judgment only if the correlation was 0.9 or greater.

Page 4.41, lines 1-8: Might do a scatter plot of mass fraction from different approaches using the 14 sites as individual data points.

Page 4.51: *"Additionally, prior to the next PM NAAQS review and as part of the planning for additional preference and valuation survey studies, a literature review of recent social science literature could usefully be conducted to assess the state of knowledge of view exposure mechanisms, and the psychological and behavioral effects associated with viewed stimuli."* Good recommendation! Needs to be done.

**Mr. Tom Moore**

Thanks to the author team for a great effort on the 2<sup>nd</sup> draft of the Policy Assessment - much more readable than the 1<sup>st</sup> draft.

Specific Comments on Section 4:

Page 4-1, lines 11-16: The discussion of the considerations behind "...staff conclusions on a range of alternative secondary standards appropriate..." should note that federal, state, and local air quality management agencies have been analyzing cumulative and individual pollutants' impacts on visibility under the National Environmental Policy Act, the New Source Review, Prevention of Significant Deterioration, Best Available Retrofit Technology, and Regional Haze Rule programs over the past 25 years. While the Administrator's decision must draw upon the factors listed in this paragraph, air quality management to improve visibility by controlling PM to reduce light extinction impacts would utilize well-developed methodologies and control methods – perhaps not as difficult a "...public welfare policy judgment.." as the current text would suggest.

Page 4-3, lines 1-2: Data available in 1997, especially in urban areas, were not based on an existing primary or secondary PM<sub>2.5</sub> NAAQS. These data were very limited for the purposes of forecasting improvement "... to some degree..." in urban PM-caused visibility impairment. The 1997 PM<sub>2.5</sub> primary NAAQS led to the first effort, funded by EPA and implemented by state and local air agencies to more completely and routinely characterize urban PM<sub>2.5</sub> composition across the nation. The expansion of the IMPROVE network in 2000-01 to support the implementation of the Regional Haze Rule led to a much fuller understanding of Class I area impacts from urban sources and regions. The forecasts of PM-caused urban visibility improvements from the 24-hour average PM<sub>2.5</sub> secondary NAAQS proposed at 50 µg/m<sup>3</sup> in 1996 were highly speculative, and the 24-hour average secondary PM<sub>2.5</sub> NAAQS of 65 µg/m<sup>3</sup> adopted by EPA in 1997 was even less protective of PM-caused visibility impairment.

Page 4-3, lines 14-17: This sentence is not necessarily true, as the requirements for air quality planning and attainment of the NAAQS are more timely and in statute, while the Regional Haze program is required under a less stringent administrative rule with a long time horizon. If and when secondary PM NAAQS are promulgated to separately protect visibility in [monitored] urban/small town/rural areas, testing of the hypothesis that the Regional Haze program adopted in rule under §169A and 169B of the CAA "...can be more responsive to the factors contributing to regional differences in visibility..." can be done. PM-caused visibility impairment in urban/small town/rural areas is both an effect and a source.

Page 4-3, lines 19-24: While in 1997, "...a regional haze program, in conjunction with secondary standards set identical to the suite of PM<sub>2.5</sub> primary standards, would provide appropriate protection for visibility in non-Class I areas." conceptually would provide protection from PM welfare impacts on visibility in the ambient environment, the EPA had little or no urban PM<sub>2.5</sub> mass or composition data at the time to make this assertion. The Regional Haze analyses and planning effort since that time suggest that an administrative rule with a 60+-year implementation time frame will not lead to the more timely and necessary reductions in PM causing welfare visibility impacts in urban/small town/rural areas. Instead the Regional Haze program guidance

from EPA addresses primarily stationary point sources, and states have accounted for the national mobile source control programs adopted by EPA primarily to attain the various primary NAAQS. The lesson learned from Regional Haze is that if impacts from PM on “non-Class I area” visibility are occurring as EPA’s 2010 PM ISA and UFVA analyses suggest, then a secondary PM NAAQS to protect visibility is now necessary - different in form, averaging time, level, and perhaps indicator from the primary PM NAAQS, along with the requisite analyses to develop emission control plans to complement the Regional Haze program.

Page 4-4, line 2: Replace “local” with “sub-regional”.

Page 4-4, line 3: Replace “City of Denver” with “Colorado Front Range urban areas from Fort Collins to Colorado Springs”.

Page 4-4, lines 5-8: While it is reasonable to assert now that visibility would improve in a “...urban area near a mandatory Class I Federal area ... by implementation of the current visibility regulations...” [which include ongoing implementation of stationary point source controls under the NSR, PSD, BART and Regional Haze programs], the urban area-specific nature and causes of PM-caused visibility impairment may not be addressed appropriately and proportionally since we have never had a specifically-visibility-protective PM NAAQS. This sentence also does not belong in the 1997 section, it is an analysis of the current situation.

Page 4-4, line 12: After “...impairment”, add “known at that time”.

Page 4-4, lines 17-18: After “...EPA”, insert “recommended separate and more stringent, but promulgated” before “revised”. Remove “the” and “by making them”.

Page 4-4, line 29: Remove “Denver” – should instead be mentioned in or around line 3 above.

Page 4-10, diagram: This diagram is a helpful depiction of the overall process followed by EPA in preparing the secondary welfare PM NAAQS analysis for visibility impacts.

Page 4-18, line 3: After “...extinction”, insert “by PM” before “...is an...”. In the same sentence, after “...that”, remove “by itself does not directly translate into a” and insert “is a direct measure of the public welfare effect, but setting a secondary welfare PM NAAQS for light extinction is not a sufficient measure of the...”.

Page 4-18, line 3: After “Light extinction”, insert “by PM”, then after “...atmospheric property that...”, delete “by itself does not directly translate into a” and replace with “ is a direct measure of the” before “public welfare effect”. Insert a following sentence: “Promulgation of a secondary welfare PM NAAQS for light extinction gives definition to the dimensions of urban visibility impairment effects by defining the measurement method(s) to characterize the indicator, as well as the form, level, and averaging time.”

Page 4-18, line 4: After “...meaningful”, insert “and the public policy effect evaluated by using” before “in the context...”. Delete “in” before “the context”.

Page 4-18: line 6: After “The perception”, insert “of some representative group of individuals” before “of the...”.

Page 4-18, end of line 13: Insert a new sentence, something like: “Further, the “scenic-ness” of a given scene is a setting- and context-based value judgment by an individual. Those individual judgments should be part of a large and representative sample size distribution.

Page 4-21: line 12: After “...which is by far the best of the four studies”, insert “due to the large sample size” and modify the remainder of the sentence to make a list including “least noisy” and “most representative”.

Page 4-29, line 13: After “...air quality conditions.”, continue the sentence by adding “by mass, not species contribution to light extinction”. Future change in species’ magnitudes and/or source mix are not likely to be proportional.

Page 4-31, line 23: Delete “...Chemical Speciation Network (CSN)...” – it does not produce hourly average mass concentrations. It would be more accurate to note the sampling schedule and averaging time for CSN in a separate sentence.

Page 4-38, line 34: The assertion that averaging for 3 years is sufficient “...to provide stability...” is not supported, particularly as NAAQS are changed to more stringent levels. The 3-average is much less than generally accepted climatological averaging periods of 7 to 10 years, nor is the 3-averaging period source-independent. If the long-time formulation of the compliance time period for the various NAAQS over a 3-year period is due to the NAAQS review and air quality planning requirement in the Clean Air Act, it should be stated as such – especially in the Policy Assessment. The effect of climate change and expected future variations in climate will also reduce the “stability” of a 3-year average.

Page 4-39, line 10: After the sentence ending in “... values.”, insert a new sentence: “Such studies were done in the absence of an EPA secondary PM NAAQS set to protect the public from welfare impacts of impaired urban visibility.”

Page 4-47, table starting line 4: Modify the table to remove “Mm-1” from every data cell. Does the coloring apply to more values than are currently “colored in”?

Page 4-49, line 2: After the sentence ending “...Administrator.”, insert a clause to start the next sentence “As there is no explicit protection for this impact at present,” before “we recognize...”.

Page 4-50, after line 12: Add a “(7)” describing what would be expected to be learned and the associated EPA activities to support the gathering and analysis of new knowledge through the promulgation, initial implementation, and the first round of “nonattainment plans” to implement this secondary welfare PM NAAQS for visibility over the 5 years from October 2011 through 2016.

Page 4-52: Noted there are only 17 references for Section 4 of the Policy Assessment, while Section 5 where no action is recommended has 41 – are there more references to add for Section 4?

**Dr. Robert Phalen**

I. General Comments on P.A. draft 2

- a. As expected, the Staff has prepared a lucid and elegant second draft of the P.A.
- b. I am struck by the limitations placed on the Staff in framing the P.A., and concerned that readers may believe that several potentially adverse secondary health consequences have been evaluated along with the direct health effects, when they have not. Thus, I recommend adding an explicit informative statement to the P.A., or the cover letter, such as:  
"Due to statute, case-law, and policy decisions, it should be noted that this Policy Assessment addresses only the direct adverse health effects of PM mass fractions. Thus, secondary public health effects, such as: (1) the potential health effects of compliance actions on jobs, and the availability of goods and services; (2) the potential health effects at locations that have positive (rather than negative) health associations with PM mass; and (3) the potential health effects of changes in PM mass on other air contaminants (e.g. UFP counts, and airborne acidity), are not considered. In short, the range of potential unintended secondary adverse consequences have not been evaluated in this document. Thus the recommendations herein may, or may not, improve overall public health."

Such a statement would both help readers to understand the current state of evolution of the NAAQS-setting process, and help guide the way for its future improvement. It also states, for those who may not appreciate what the P.A. does, and does not, achieve.

- c. On pg. 3-14, lines 9 - 13: Strike the sentence, "It is possible that such differences in particle composition could affect particle toxicity,..." Numerous studies have shown that particle composition definitely, not "possibly" affects particle toxicity.
- d. On pg. 3-44, line 26: For the sake of transparency add, "from the direct adverse effects of individual criteria air pollutants" after "public health".

II. Charge Question no. 5

- a. The approach is o.k.
- b. the application of the approach is o.k.

**Dr. Kent Pinkerton**

The Second External Review Draft of the Policy Assessment for the Review of the Particulate Matter National Ambient Air Quality Standards is a well-written document that brings to focus the most relevant scientific evidence and technical information in determining whether and how to revise the PM standard for the country. The chapters of the Policy Assessment document are well organized to address primary standards for fine particles (PM<sub>2.5</sub>) and thoracic coarse particles (PM<sub>10-2.5</sub>), as well as secondary standards for PM-related visibility impairment and non-visibility welfare effects. This second draft of the policy assessment is greatly improved over the first version. The staff is to be commended for their efforts to address each of the concerns of CASAC in this second version of the policy assessment.

Charge Question #4: Key uncertainties and areas for future research and data collection. What are the Panel's views on the areas for future research and data collection outlined in this section on relative priorities for research in these areas and on any areas that ought to be identified?

This section of the document provides a list of areas for future health-related research, along with some of the key uncertainties, model development and data collection needs, as well as research and data collection efforts that should be pursued in the future. The list is excellent, but dwells predominantly on those areas to provide further epidemiological evidence of PM-related health effects. Although appropriate and highly desirable, future studies should also include toxicological studies to provide defining and confirming evidence for the biological plausibility of PM-related health effects. These studies should be based on the same premise as posed for the future need for epidemiological evidence in terms of components and sources of PM, the influence of particle size as well as co-pollutant interactions with a particular emphasis on ozone.

This section further recommends new research and analyses for exposure related factors which include intra-city and inter-city differences related to various PM components and size fractions, all excellent points. However, future consideration should also be given to particle transport and aging as a potentially important factor to alter particle effects and toxicity as well. Consideration for new research should also encompass the interaction of climate conditions (i.e. climate change and temperature) on PM incidence, concentrations and distribution, including factors leading to desertification (dust formation), increased wildfires and secondary particle formation. An important research consideration is to further evaluate how ultrafine particles contribute to the PM<sub>2.5</sub> particle size fraction, both temporally and spatially as these particles undergo accumulation and/or aggregation. The recommended future monitoring measurements of the section are briefly stated, but are timely and relevant. Model development to improve models for estimating PM<sub>2.5</sub> mass and composition are clearly important as a future research priority.

**Mr. Rich Poirot**

**Pre-Meeting Review Comments on 2nd Draft PM Policy Assessment**

Generally, I thought the second draft PAD was a substantial improvement on the first draft – logically reasoned, clearly and concisely presented, and responsive to previous CASAC review comments. My pre-meeting comments are primarily focused on Chapter 4 (secondary visibility standards) and also respond to charge question 9 on the proposed range of levels for a PM<sub>10</sub> primary standard.

**“Controlling” Annual PM<sub>2.5</sub> vs. 24-hour Peaks**

I also wanted to confess ignorance and request clarification on the rationale for the proposed need to “pair” the annual and 24-hour PM<sub>2.5</sub> standards such that the annual standard would remain the “controlling” standard. I don’t understand why this is logical or desirable, as it would seem inconsistent with the observations of separate kinds of effects resulting from acute and chronic exposures to PM<sub>2.5</sub> pollution. It also seems like this has become, is becoming or soon will become a less desirable air quality management approach as progress is made (and continues with CAIR) on reducing the large regional source influences most important for high annual concentrations over large areas. The scatter plot Figure 2-10 (page 2-75) and the Figure 2-9 box/whiskers on the preceding page do seem to indicate that a majority of US sites have 98<sup>th</sup> percentile 24-hour concentrations which are about 2.5 times their annual means, but that there are a number of sites particularly in the Northwest that have ratios of 3.5 to 1 or higher. Taking a closer look at data from that region, I think many of these sites are in relatively deep mountain valley locations, with strong winter seasonal early morning peaks under stagnation/ inversion conditions. Much of the “peakiness” here is due to wood-smoke, other heating fuel burning and gasoline motor vehicle and diesel exhaust, which not only reach much higher than average concentrations on bad days but see even more extreme short-term hourly morning peaks during rush hour. Are these sources, their associated carbonaceous aerosols, and extreme temporal exposure regimes so benign that control efforts should focus instead on the summer ammonium sulfate that tends to dominate chronic exposures in areas which exceed annual standards but not the current 24-hour standard?

I also think there could be an important conflict here with health messaging and public communication. States and municipalities issue daily air quality forecasts and during pollution events issue air quality alerts, advisories, action days, etc. based on the “Air Quality Index” which is directly linked to the levels of the NAAQS (and for which EPA still hasn’t provided official guidance relative to the current 24-hour PM<sub>2.5</sub> NAAQS of 35). At a minimum this guidance needs to be updated, and it and the short term standard should reflect short-term concentrations at which effects may be expected for sensitive groups – regardless of whether a controlling annual standard is useful for other purposes.

**9. Level (section 3.3.4): What are the Panel’s views on the following:**

**a. The approach taken by staff to identify potential alternative PM<sub>10</sub> standard levels, in conjunction with a 98th percentile form, including the weight placed on different studies?**

Given the limitations in currently available coarse particle epidemiological studies, the absence of statistically significant results in many of the mortality and morbidity studies, and the stated intent

to focus more on urban than rural coarse particles by retaining a PM<sub>10</sub> indicator (tricky, but I think I like it for now): the approach taken to identify a range of levels for a revised PM<sub>10</sub> standard, using a 98<sup>th</sup> percentile form, generally appears to be reasonable.

**b. Staff's conclusion that the evidence most strongly supports standard levels around 85 µg/m<sup>3</sup>?**

Part of the stated justification for the upper end of the range was the absence of statistically significant positive associations between PM<sub>10-2.5</sub> and mortality in single-city studies with 98<sup>th</sup> percentile PM<sub>10</sub> concentrations below this level. While there is some logic to use this to help determine an upper bound level, it should also be recognized that there were a number of mortality and morbidity studies showing relatively consistent positive, but non-significant results at lower levels, and that there are a number of factors which will tend to push epi results for coarse particles toward the null hypothesis. PM<sub>10-2.5</sub> is not measured very precisely, especially when compared to PM<sub>2.5</sub>. The spatial representativeness of PM<sub>10-2.5</sub> measurements is also very limited, relative to the density of measurements and difficult to associate with large populations. There are also substantial differences between indoor and outdoor concentrations of PM<sub>10-2.5</sub>, as outdoor concentrations don't penetrate indoors very efficiently and as there are also often large, independent indoor sources of coarse particles, further complicating accurate human exposure assessments. All of the above will tend to push results toward null and/or make them difficult to confirm with high statistical confidence in areas with lower ambient air PM<sub>10-2.5</sub> concentrations. Thus the upper bound of 85 µg/m<sup>3</sup> may not provide much of a margin of safety.

Another part of the justification for the upper end of the range was the stated intent of not weakening the existing PM<sub>10</sub> standard of 150 µg/m<sup>3</sup> with an "expected exceedance" form, while transitioning to a more stable (and less sample-size dependent) 98<sup>th</sup> percentile form. I think there is at least a wee bit of logic to this (don't weaken the status quo) argument, as there is no strong evidence for loosening the current standard. However, I don't agree that this logic necessarily leads to a 98<sup>th</sup> percentile form at 85 µg/m<sup>3</sup>. This judgment seems to be primarily supported by the Figure 3-7 (page 3-39) scatter plot comparing expected exceedance design values with 98<sup>th</sup> percentile design values for the same recent 3-year periods (the large solid symbols, incidentally, make it hard to really see the data here). The fairly broad scatter indicates that there is a lot of variability in the relationship and that there is no single "equivalence point" for comparing the two metrics; at the 150 µg/m<sup>3</sup> level of the current standard, the 98<sup>th</sup> percentile counterparts range from about 30 to 130 µg/m<sup>3</sup>. A regression line (which doesn't appear to fit the data very well) intersects the 150 µg/m<sup>3</sup> expected exceedances level at a 98<sup>th</sup> percentile level of about 85 µg/m<sup>3</sup> and so this is taken as the point of "equivalence" and used to support the selection of 85 µg/m<sup>3</sup> as the upper bound for a 98<sup>th</sup> percentile level. It looks to me like there are many more points below this line than above it – that would be afforded less, and in some cases much less protection that they receive under the current standard. From Table 3A-1 in Appendix 3A, it can be noted that the population protected by current 150 µg/m<sup>3</sup> expected exceedance PM<sub>10</sub> standard is 32,169,000, and that this would be reduced by about 30% to a protected population of 22,736,000 if an "equivalent" 98<sup>th</sup> percentile level of 85 µg/m<sup>3</sup> were selected. The 98<sup>th</sup> percentile form in Table 3A-1 that affords protection to a population that comes closest to that afforded by the current standard is 75 µg/m<sup>3</sup> and I think new 98<sup>th</sup> percentile standards at levels above 75 µg/m<sup>3</sup> should be recognized as weakening the current standard. So again, I think the upper bound is not especially well justified.

**c. The alternative approach to considering the evidence that could support standard levels as low as 65 µg/m<sup>3</sup>?**

I think the rationale for this lower bound is reasonable, and might be further strengthened by noting that there may be good reasons for absence of significant results, and that the relative consistency among many studies finding positive but non-significant results is supportive, and by noting that a standard at this level would reduce, but not eliminate the number of sites for which a 98<sup>th</sup> percentile form would weaken the current standard.

**11. Current Approach (section 4.1.3):**

**a. What are the Panel's views regarding our approach for translating technical evidence and assessment results into the basis for assessing current fine particle standards and considering alternative standards to provide protection against PM-related visibility impairment?**

The approach for translating and presenting the technical evidence and assessment results is logically conceived and clearly presented. The various tables and graphics in Chapter 4 and its associated appendices are very helpful in communicating the inherently complex information that unavoidably results from the evaluation of so many optional combinations of indicators, averaging times, levels and forms.

**b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 4.2) and potential alternative standards (section 4.3)?**

The detailed estimates of hourly PM light extinction under current conditions and for “what if” scenarios of just meeting current standards clearly indicate that these current standards do not protect against levels of visual air quality which have been judged to be unacceptable in all of the available urban visibility preference studies.

Given the limitation that there are not currently available methods for directly measuring the preferred indicator of PM light extinction, the alternative indicators of hourly PM<sub>2.5</sub> mass or estimated hourly PM<sub>2.5</sub> light extinction (composition and humidity-adjusted hourly PM<sub>2.5</sub> mass) are logical choices for a revised secondary standard. Each indicator has advantages and disadvantages compared to the other. In my opinion, the pragmatic advantages that a PM<sub>2.5</sub> mass indicator might have over the estimated PM<sub>2.5</sub> extinction indicator are understated. I also think that there may be reasonable approaches to further simplify the estimated extinction approach that would not significantly compromise its benefits as an effective regulatory metric. See answer to 12b below.

**12. Nature of the Indicator (section 4.3. 1): What are the Panel's views on the following:**

**a. Staff's consideration of the three indicators identified in this section and our conclusions on the appropriateness of these indicators for consideration in this review?**

Generally, the 3 indicators evaluated are logical options which essentially span a range from directly measured PM extinction (theoretically ideal but currently impractical) to directly measured (dried) PM<sub>2.5</sub> mass (easy to implement but not directly representative of visibility effects). The “simplified” estimated PM<sub>2.5</sub> extinction option is a sort of compromise between the two measurement extremes, although I think that other less complex intermediate options could also be considered.

**b. The development and evaluation of a new approach that is based on using speciated PM<sub>2.5</sub> mass and relative humidity to calculate PM<sub>2.5</sub> light extinction by means of the IMPROVE algorithm?**

While this is an approach that could be implemented using existing measurements, I think there may be simpler alternatives that would produce similar results and which should be evaluated. Reflecting back on the comparison of hourly PM<sub>2.5</sub> mass vs. hourly PM light extinction in Table D-1 of the UFVA document, it can be noted that the average correlation ( $R^2$ ) is 0.70 across all 14 urban areas (excluding St. Louis with its questionable data) – which I’ll first argue is not really all that bad, and is way tighter than the relationships between any other primary or secondary pollutant NAAQS indicator and any associated effect. A number of adjustments could improve upon the quality of an hourly PM<sub>2.5</sub> mass indicator, but each adjustment adds complexity, and the currently proposed adjustments are very complex for a regulatory metric, and would require combining data from continuous PM<sub>2.5</sub>, filter FRM PM<sub>2.5</sub>, speciation PM<sub>2.5</sub> (3 filters) and relative humidity measurements (and could only be applied at sites where all of the above were measured). In many states, the continuous data are adjusted to be FRM-like prior to submittal to AQS, but that is typically conducted after the end of each calendar quarter. While the need to use FRM filter data might be eliminated by use of continuous FEM instruments, the proposed use of the (concurrent month) speciation data has the added disadvantage of delaying the availability of the estimated extinction estimate until several months after real time. I question whether the added complexity and time delay is justifiable compared to simpler adjustment approaches.

One simpler approach would be to develop (by regression of hourly PM<sub>2.5</sub> mass and RH vs. the estimated PM<sub>2.5</sub> light extinction) a generic “aerosol f(RH)” function. This could be done using historical data on a site-specific or regional basis, and calculated on a seasonal, or even monthly basis if need be. The resulting equations could be used to convert continuous FEM PM<sub>2.5</sub> mass and RH data to estimated PM<sub>2.5</sub> extinction in near-real time. A slightly more complex variation on this would be to use the historical speciation data – again on a seasonal basis if warranted, on either a site-specific or regional basis, to develop quarterly composition estimates. These would include seasonal estimates of the hygroscopic mass fractions which could be multiplied by the measured mass and enhanced by IMPROVE f(RH) functions. A third variation would be to discard the current RH data and instead use historical hourly RH averages – again on a quarterly or monthly basis and expressed as site-specific or regional averages. Following somewhat the logic of the regional haze rule, the use of climatologically derived RH and f(RH) functions might reproduce actual hourly PM light extinction less perfectly, but might still be a better regulatory metric. Arguably it would be more effective to reduce concentrations of hygroscopic species on months and hours of day when the combinations of pollutant concentration and RH have tended (and will tend) to be highest, rather than the specific month and hour of day when an extreme event occurred.

I’m confident that any of the above approaches would represent a substantial improvement over the use of fine mass alone as an estimator of visibility effects, but the calculations would be simpler and could be done one time, in advance, so that the resultant estimated light extinction could be reported in near-real time, employed as a public communication tool, compared to real-time extinction measurements as they evolve (or as ASOS scattering data become available at

higher resolution, which is happening now), etc. If regional average equations worked reasonably well, an advantage would be to allow the extinction estimates to be made at all (> 550) continuous PM<sub>2.5</sub> sites – not just the (<200) sites with speciation data (and far fewer, I suspect where FRM and CSN – running every 3<sup>rd</sup> day are collocated with continuous PM<sub>2.5</sub>).

This reminds me to suggest that it could be useful to see a table or map indicating the numbers and locations of Continuous, FRM and Speciation PM<sub>2.5</sub> sites and indications of where all the above (with the filters running every 3<sup>rd</sup> day) are collocated (maybe also including continuous PM<sub>10</sub> if there are many of those out there collocated with PM<sub>2.5</sub>).

**c. The assessment approach and results comparing the PM components that contribute to the hours selected in the top percentiles for PM<sub>2.5</sub> mass and PM<sub>10</sub> light extinction?**

The approach and results comparing PM components that contribute to the highest extinction percentiles are logically contrived and clearly presented. As a practical matter, I don't think its likely that states or municipalities will develop vastly different source control strategies based on relatively subtle differences in the regulatory metrics. For example, it's unlikely that a lot of effort would be "wasted" on visibility-inefficient attempts to control fine soil if a PM<sub>2.5</sub> mass indicator was selected. Nor are there practical options for sub-daily reductions in hygroscopic sulfates and/or nitrates that might be directed toward "the wrong hours" if a mass indicator, or a percentile based on all daylight hours was employed.

**13. Alternative Levels and Forms (section 4.3.3): What are Panel views on the following:**

**a. The performance assessment which focused on the Candidate Protection Levels of 64, 112, 191 Mm-1 for PM<sub>2.5</sub> light extinction and speciated PM<sub>2.5</sub> mass-calculated light extinction, and alternative levels of 10, 20, and 30 µg/m<sup>3</sup> for PM<sub>2.5</sub> mass concentration?**

These ranges of levels for PM<sub>2.5</sub> light extinction, estimated extinction and fine mass indicators are logically derived, and the performance assessments for exceeding/ attaining these various candidate protection levels are clearly presented. Various combinations of CPLs and percentiles could be considered which would affect the spatial extent, frequency and severity of non-attainment of a visibility-related secondary standard. Because visibility is so sensitive to impairment by concentrations of fine particles and associated water (i.e. particles as they exist in the ambient air), it should be expected that levels of PM light extinction considered "acceptable" to human observers would be exceeded relatively frequently in many areas and by relatively high margins in some areas. Attaining specific threshold conditions may be especially difficult and require very long-term strategies in areas subject to frequent high humidity, stagnation or inversion conditions, or persistent regional transport influences. Consequently, guidance provided by EPA on the expected pace, or rate of progress toward attaining the secondary standard in the implementation phase is likely to become an important component of the standard's ultimate performance, which would modify the "stringency" of any specific combination of level and form.

As indicated previously, there may be some advantages to using a PM<sub>2.5</sub> mass indicator (at least on an interim basis until more direct PM light extinction methods can be developed and evaluated). Compared to an extinction indicator, a mass indicator would tend to de-emphasize somewhat the importance of hygroscopic sulfate and nitrate scattering aerosols, which tend to impair visibility

(and as Ted points out exert a cooling effect on climate) over relatively large areas, and emphasize the relative importance of more locally produced carbonaceous aerosols which might have both visibility and climate benefits. A mass indicator would also somewhat reduce the differences in stringency between the East and West, and at a given level might be somewhat more feasible to attain in the more humid (and possibly less scenic) East while affording greater protection in the dryer (and more scenic) West. This option might be worth considering if EPA is not able to utilize a “progress-based” approach in implementing a secondary standard.

**b. Use of three-year averaged 90th and 95th percentiles in conjunction with a 1-hour daily maximum form and use of three-year averaged 98th percentile in conjunction with the all daylight hours form?**

The illustrations provided indicate that the choice between a 90<sup>th</sup> or 95<sup>th</sup> percentile with a 1-hour daily maximum form or a higher 98<sup>th</sup> percentile based on all daylight hours does not really seem to have much effect on the species implicated or the kinds of control strategies that would be most effective. I don't really think the different “susceptible population” exposure arguments make are especially compelling either, and believe a choice between these two functionally similar options could be made for other reasons. For example, the single worst daylight hour is a simpler calculation, although it would also be more susceptible to measurement noise that effects some of the continuous PM<sub>2.5</sub> mass measurement instruments.

**c. Insights to be drawn by comparing the PM components for hours included among the 10% highest for a 1-hour daily maximum form with the hours included among the 2% highest for an all daylight hours form, for the various indicators considered (Appendix C)?**

See answer to B above. Note that I've also suggested alternative approaches for estimating hourly extinction that would permit simpler and more timely hourly extinction estimates. Occasionally these simpler estimates could be distorted – for example if a moderate forest fire or fine dust impact was occurring during a period of high humidity and historically projected high sulfate concentration. Use of the single worst hour per day would simplify the task of identifying and correcting such occasional outliers.

**14. Key Uncertainties and Areas for Future Research and Data Collection (section 4.5): What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?**

Generally, I think this section is very good and identifies several important research needs for the near future. Often however, the best laid plans...never get funded. In this case I think expanded visibility preference studies and establishing a small pilot urban visibility monitoring network (which includes some support for instrument development and evaluation) would be extremely valuable.

**Post-meeting Review Comments on Second Draft PM PAD**

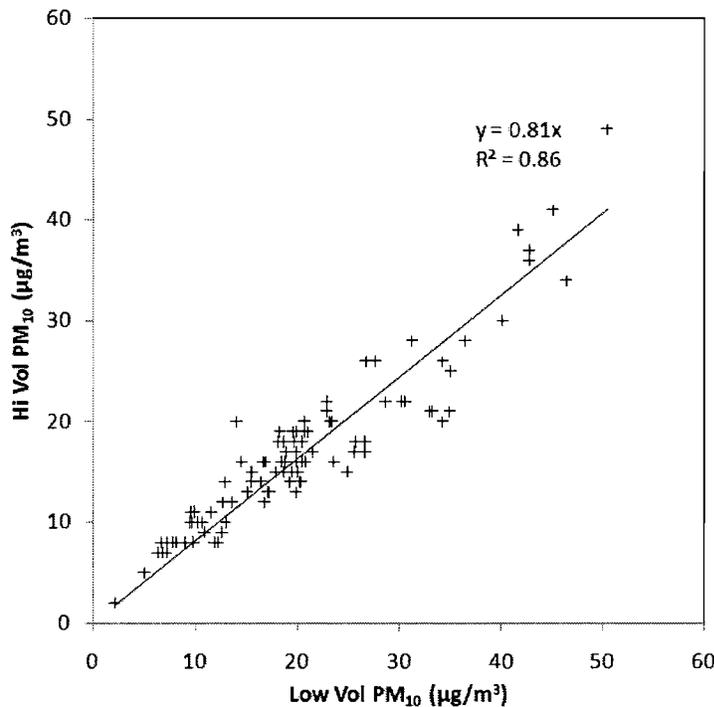
**PM<sub>10</sub> Indicator for Coarse Particles**

This didn't get discussed at the 7/25-26/10 meeting, but I wanted to suggest, belatedly, that in revising the PM<sub>10</sub> standard, EPA should consider specifying the low volume PM<sub>10</sub> method as the sole federal reference method (FRM). Currently, both low volume and high volume PM<sub>10</sub> methods are designated as FRMs, although they have consistently been demonstrated to produce different results in field and laboratory comparisons – with the high volume method typically showing lower concentrations. For an example showing differences of 25% to 35% in an area with very high PM<sub>10</sub> and coarse mass concentrations, see: Ono, D.M., E. Hardebeck, J. Parker, and B.G. Cox (2000) Systematic Biases in Measured PM<sub>10</sub> Values with U.S. Environmental Protection Agency-Approved Samplers at Owens Lake, California, *J. Air & Waste Manage. Assoc.* **50**:1144-1156. For an example showing differences of about 20% from an area with relatively low PM<sub>10</sub> and coarse mass, see the example below from Burlington, VT.

Wind tests

PM<sub>10</sub> from collocated Hi Vol (Wedding) and Low Vol (R&P) Samplers in Burlington, VT, 2004-05

tunnel have generally



demonstrated similar results and show the hi volume PM<sub>10</sub> samplers can have cut points significantly less 10 microns, especially under high wind conditions. The recently established FRM for PM<sub>10-2.5</sub> (by difference) specifies low volume PM<sub>10</sub> (and PM<sub>2.5</sub>) samplers. If the PM<sub>10</sub> standard is revised with the intention of providing better protection against coarse particle effects, it would be a timely opportunity limit the FRM to low-volume samplers. This would afford better protection, assure more consistent data across space and time, increase the collection of and assure better consistency with PM<sub>10-2.5</sub> measurements, and produce samples on Teflon (rather than quartz) filters more conducive to speciation analysis - for PM<sub>10</sub> and for PM<sub>10-2.5</sub> (by difference).

**Dr. Ted Russell**

Overall, this draft of the PM PAD is much improved and lays the foundation for informing the revision of the PM standards, providing both a synopsis of the prior documents and the procedure used to develop suggestions for the revisions. Their conclusions are generally supported by the information in the prior documents and have been responsive to CASAC's prior comments as well. My areas of disagreement/concern are rather specific as discussed below.

My major concern has to do with consideration for the potential of the tightening of the standards to exacerbate climate warming if the appropriate fraction of PM is not preferentially controlled. This concern has to do most with the level at which the secondary standard. Decreasing light scattering aerosols will improve visibility, but increase radiative forcing. It would be better to focus on reducing light absorbing aerosols to both improve visibility and potentially reduce warming (there is uncertainty about the latter). There is also a growing body of evidence that EC is more strongly associated with various health impacts, so in the implementation, focusing on EC controls would be a win-win.

Chapter 3

**7. Indicator (section 3.3.1): What are the Panel's views on the approach taken to considering standard indicator and on staff's conclusion that PM10 remains an appropriate indicator in this review?:** As noted previously, I view the use of PM10 as a reasonable choice as laid out by the PAD.

**8. Form (section 3.3.3): What are the Panel's views on the approach taken to considering the form of the standard and on staff's conclusion that revising the form to a 98th percentile form would be appropriate for a 24-hour PM10 standard meant to protect against exposures to thoracic coarse particles?** Using a multiyear average of a percentile (e.g., 98<sup>th</sup> in this case) is reasonable and consistent with other pollutants. I may differ with others in that I prefer a multiyear average of the 98<sup>th</sup> percentile as opposed to the 98<sup>th</sup> percentile of a multiyear distribution, both for consistency with other pollutant standards (particularly for PM2.5) and for stability for planning purposes.

**9. Level (section 3.3.4): What are the Panel's views on the following:**

**a. The approach taken by staff to identify potential alternative PM10 standard levels, in conjunction with a 98th percentile form, including the weight placed on different studies?**

**b. Staff's conclusion that the evidence most strongly supports standard levels around 85 µg/m3?**

**c. The alternative approach to considering the evidence that could support standard levels as low as 65 µg/m3?**

The approach used by staff in determining an appropriate level is consistent with the approach used for other pollutants and PM2.5, and is based on the relevant health studies. If the 24-hr PM2.5 standard is tightened, however, this would argue for tightening of the 24-hr PM10 standard beyond the "around 85" (or below 65 if one is persuaded that the standard should be effectively tightened) currently proposed to maintain the appropriate level of PM<sub>10-2.5</sub> allowed. (That is, the approach

might be posed as taking the 24 hr PM<sub>2.5</sub> and adding 50 (or 30, if you want to go with the tighter level). Their reasoning for considering a level as low as 65 is viable, and they note that while studies tended to have a decrease in statistically significant positive results at the lower levels, a bulk of the studies (but not all) still found positive associations. Another reason to explore levels below 85 is that some areas that meet an 85 98<sup>th</sup> %ile can have levels above the 150 current standard, so this would effectively loosen the standard.

Chapter 4.

**12. Nature of the Indicator (section 4.3. 1): What are the Panel's views on the following:**

- a. Staff's consideration of the three indicators identified in this section and our conclusions on the appropriateness of these indicators for consideration in this review?**
- b. The development and evaluation of a new approach that is based on using speciated PM<sub>2.5</sub> mass and relative humidity to calculate PM<sub>2.5</sub> light extinction by means of the IMPROVE algorithm?**
- c. The assessment approach and results comparing the PM components that contribute to the hours selected in the top percentiles for PM<sub>2.5</sub> mass and PM<sub>10</sub> light extinction?**

Staff has laid out three potential indicators:

1. PM<sub>2.5</sub> mass
2. Directly measured PM<sub>2.5</sub> light extinction
3. Mass-calculated light extinction

First, if the secondary effect of interest is PM impacts on visibility, the indicator should include all components of PM that impact visibility unless reasoned otherwise. If we are going to directly measure light extinction, there are good reasons to limit the measurements to just those particles less than PM<sub>2.5</sub>, driven largely by instrumental concerns, and supported by the more widespread impacts of fine PM versus coarse. If there are no instrumental limitations, the inclusion of PM-coarse on visibility should be included or argued away with sound reasoning.

Each of the three has potential benefits, strengths and weaknesses. The PM<sub>2.5</sub> mass indicator is the easiest to implement, but as shown both here and the UVFA it is not necessarily a good indicator of light extinction. What is not shown is that the relationships developed for each city will also vary with time, adding further uncertainty in using PM<sub>2.5</sub> mass as an indicator for visibility degradation. The use of a mass indicator would not necessarily lead to selecting strategies that are selected to improve visibility the desired amount. Given the problems with this indicator, and the advantages of the other two, it should be ruled out. EPA does not provide a strong argument for its consideration. Further, a reasoned argument for not including PM coarse impacts should be given. Appendix 4 provides some evaluation of the use of a PM<sub>2.5</sub> mass indicator, but does not address concerns about the extent of control that would be needed to provide the desired light extinction.

Measuring light extinction directly has the benefit that you are truly measuring the quantity of concern. Technologies exist currently, and others are being tested and further developed, to provide such information, and such information can augment our understanding of atmospheric

dynamics of the pollutants that impact health and visibility. On the other hand, those instruments do not provide information, directly, on the species leading to visibility degradation.

A PM<sub>2.5</sub> Speciated Mass Calculated Light Extinction Indicator has the advantage of giving results that are likely close to the actual light extinction due to PM<sub>2.5</sub> aerosol and relies on current measurements. On the other hand, the performance of the proposed approach has not been tested against direct measurements (currently, it has been model-to-model evaluation) and there have been a variety of simplifications added to simplify the procedure. A particular concern is that concentrations of constituents of PM<sub>2.5</sub> correlate with RH and aerosol water content (e.g., nitrate, and components of organic carbon). At present, there are only 24-hour average measurements of those constituents, so the likely periods where visibility is most degraded (where RH is high), will also have higher nitrate and OC that would not be captured in a daily (or longer) average composition. Further, both those constituents can be lost in some continuous and/or integrated measurements, adding further uncertainty to correctly calculating the actual visibility reduction at the time of the peak hourly extinction. Until continuous measurements of the components of PM<sub>2.5</sub> are employed, this issue is going to plague this approach. Thus, while much better than just using PM<sub>2.5</sub> mass, this approach can lead to incorrect estimates of visibility degradation, and we currently do not know the extent of this problem. One issue that arises with choice of this indicator as other than a bridging approach (to bridge between now and the time direct measurements can be used) is that if this were to be the indicator of choice, it might as well include PM-coarse. A driving reason to just consider just PM<sub>2.5</sub> impacts on visibility is instrumental if this is not being used to bridge the gap.

As an aside, the limit of 90% RH has an added benefit beyond instrumental considerations, that being  $f(\text{RH})$  in the extinction calculation goes up dramatically with RH beyond 90%, and at 90% it is about 4. Above 3.3, it biases the controls to sulfate and nitrate and away from EC on a per mass basis (my climate-related concerns).

As a note, Appendix 4 provides critical support for the arguments laid out in support of the three indicators. However, it is a very difficult read, and it would help if they could identify the major questions being addressed and provide more succinct responses with the appropriate foundation. At present, they provide too many graphs and tables without targeted summary graphs and tables. Also, on 4b-22, there is an error in that a slope of 1.07 does not indicate a bias of 7% unless the intercept is zero. (Otherwise, LA and NY would have negative biases, which are impossible.) Further, you should not change scales in the graphs when asking for people to use them for comparison. Having a series of stacked, colored bar charts is not a very good way to provide a quantitative understanding of relationships. Other figures/tables can be more informative in this case.

- 13. Alternative Levels and Forms (section 4.3.3): What are Panel views on the following:**
- a. The performance assessment which focused on the Candidate Protection Levels of 64, 112, 191 Mm<sup>-1</sup> for PM<sub>2.5</sub> light extinction and speciated PM<sub>2.5</sub> mass-calculated light extinction, and alternative levels of 10, 20, and 30 µg/m<sup>3</sup> for PM<sub>2.5</sub> mass concentration?**
  - b. Use of three-year averaged 90th and 95th percentiles in conjunction with a 1-hour daily maximum form and use of three-year averaged 98th percentile in conjunction with the all daylight hours form?**

**c. Insights to be drawn by comparing the PM components for hours included among the 10% highest for a 1-hour daily maximum form with the hours included among the 2% highest for an all daylight hours form, for the various indicators considered (Appendix C)?**

- a) I might recommend not including three significant digits in the CPLs if the final direction chosen goes that way. In terms of level, given my climate-concerns, I would tend towards the less stringent end of the spectrum unless there are some safeguards as to going after the warming components first.

**Q14: Uncertainties and Areas for Future Research and Data Collection:** They have captured some of the key research areas and uncertainties (e.g., visibility preference studies). However, as part of the light extinction measurement/monitoring program, instrument development should be added. Another key uncertainty in terms of setting a visibility standard is assessing the impact of such a standard on potential climate forcing. This would be a somewhat involved study looking at potential regional climate changes from reducing specific components of PM, and it is recognized that this would be pushing present modeling approaches. A general concern of mine is that the potential adverse consequences of reducing components of PM<sub>2.5</sub> that would lead to warming have not been adequately wrapped in to the considerations of the current review. Warming will have both health and welfare implications. While I agree that there are significant uncertainties in the climate responses, the likely outcomes should influence the choice of a standard (thus my tendency to a less tight secondary standard unless something is done to focus on the warming components).

**Dr. Frank Speizer**

**General Comment:** Staff should be congratulated on an excellent job of incorporating suggestions from CASAC as well as streamlining the PA. The addition of an Executive summary and the format used within the text should go a long way as a model for the future. Most of my comments below (in bold) represent minor “tweaking” of the text and might be considered alternative semantics. There are a few places where they might bear discussion of emphasis.

**Charge to the Panel in Reviewing the Second Draft PM Policy Assessment**  
Chapter 2 (Primary Standards for Fine Particles)

**1. Current Approach (section 2.1.3):**

*a. What are the Panel’s views on the staff’s approach to translating the available epidemiological evidence, risk information, and air quality information into the basis for reaching conclusions on the adequacy of the current standards and on alternative standards for consideration?*

**Section 2.1.3 provides a logical and thorough discussion of the approach to be applied. Although I previously questioned the usefulness of imbedding rhetorical questions in the text (see beginning of section 2.2) I am now convinced that this is helpful since it better focuses the discussion within each section and provides a logical sequence to the discussion.**

**I applaud the staff for expanding the discussion on evidence of life stages of risk as well as specific susceptibility risk factors and the introduction of the use of combined empirical data and risk assessment.**

**With regard to the adequacy of the current standard, it may only be a matter of semantics, but I would suggest that the statement at the bottom of page 2.30 is not quite strong enough. The data presented more than adequately indicate that that the current standard is not as protective with a margin of safety and thus to indicate that the data “call into question” the adequacy could have been more forcefully indicated to say that the current standard is simply not protective. That is what the rest of the paragraph says. Ditto the consideration of the risk assessment data and as indicated bottom of page 2.43.**

*b. Has staff appropriately applied this approach in reviewing the adequacy of the current standards (section 2.2) and potential alternative standards (section 2.3)?*

**Yes**

**2. Form of the Annual Standard (section 2.3.3.1):**

*a. What are the Panel’s views on the additional analyses conducted to characterize the potential for disproportionate impacts on susceptible populations, including low income groups and minorities associated with spatial averaging allowed by the current annual standard?*

**Good job in raising the logic of the issue and why it would be inappropriate to continue to rely on spatial averaging**

*b. In light of these analyses, what are the Panel's views on staff's conclusion that the form of the annual standard should be revised to eliminate spatial averaging?*

**Top of page 2.54:** Although this is an attempt to correct a deficiency with regard to identifying the problem of highest values apparently being recorded in area of lowest social class and potentially minority population, it is not clear that the wording solves the problem. "...measurements made at the monitoring site that represents "community-wide air quality" recording the highest PM2.5 concentration". I think a footnote is need to define "community-wide air quality" For example, what if there is a pocket of folks living in a highly impacted area but they are small enough that they would not be considered "community-wide" These might be the only blacks living in a 1 mile radius in a 10 mile radius town and thus would not be considered "community wide".

**3. Alternative Levels (section 2.3.4):** *What are the Panel's views on the following:*

*a. The insights that can be gained into potential alternative standard levels by considering:*

*i. Confidence bounds on concentration-response relationships?*

**It would appear that Staff is not confident enough in the existing data to use the widening of confidence bounds as a measure of where uncertainty becomes important. However, in their evaluation of the data it seems clear that until one reaches about 12ug/m<sup>3</sup> for the annual average the confidence bounds are relatively tight and thus, I would have thought that Staff could have used this number as a "benchmark" with which to assess other alternatives with more confidence than expressed.**

*ii. Different statistical metrics that characterize air quality distributions from multicity epidemiological studies?*

**The arguments given for using the composite monitor and the maximum monitor distributions are well presented. The arbitrary selection of 1 SD below the max mean is logical and consistent with the data in terms of keeping uncertainty at a minimum, however, it is clear that much of the uncertainty below that level relates to lack of data rather than increased variability. Thus, the more conservative alternative of assessing between 25-10 percentile should not be off the table.**

*b. Potential alternative annual standard levels based on composite monitor distributions versus maximum monitor distributions?*

**The differences between these two alternative seem to me minimal and more semantic in interpretation than actually change the concluding numbers.**

*c. Use of risk information in informing staff conclusions on alternative annual and 24-hour standard levels, including approaches used to assess overall confidence and potential bias in the risk estimates?*

**Provides additional confidence that the conclusion are not wildly different comparing risks.**

*d. Staff's conclusion that alternative annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$  are most strongly supported by the available evidence and risk-based information?*

**Agreed.**

*e. Staff's approach of focusing on peak-to-mean ratios to inform the level of a 24-hour standard that would provide supplemental protection to a generally controlling annual standard?*

**This appears to be an important consideration and is appropriate. However, it is not clear that it is adequately dealt with in discussion, since the discussion seems to focus on two not necessarily matched alternatives. (Eg. 13-11 $\mu\text{g}/\text{m}^3$  with a 24 hour of 35; and 11 $\mu\text{g}/\text{m}^3$  with a 24 hour of 30). There should be a whole range in between, and figure 2-10 suggests that Northwest is truly out of bounds with either. Does this suggest that the peak-to-mean doesn't work?**

*f. Staff's conclusion that consideration should be given to retaining the current 24-hour standard level of 35  $\mu\text{g}/\text{m}^3$  in conjunction with annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$ , and that consideration could also be given to an alternative 24-hour standard level of 30  $\mu\text{g}/\text{m}^3$  particularly in conjunction with an annual standard level of 11  $\mu\text{g}/\text{m}^3$ ?*

**See above.**

**4. Key Uncertainties and Areas for Future Research and Data Collection (section 2.5):**

*What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?*

**The list of key areas of research is comprehensive and covers the main areas to be considered. Although mentioned I would have like to have seen a more full discussion of potential for changes in effects associated with time over the life course of populations. With regard to relative priorities, I believe, wisely, Staff has avoided ranking the various research need. However, it may be worth a discussion by CASAC and Staff as to whether one or two of the categories might be emphasized. For example, have we reach the stage where the focus should be on components of PM and or co-pollutants over and above further data in other categories? By taking these two arenas on can we incorporate many of the other suggested areas both to reduce uncertainty and improve understanding?**

*Chapter 3 (Primary Standard for Coarse Particles)*

**5. Current Approach (sections 3.1.4, 3.2, 3.3):**

*a. What are the Panel's views on the approach to translating the available evidence and air quality information into the basis for reviewing the coarse particle standard?*

Unfortunately, the approach seems to indicate that studies of PM10-2.5 which are few in number and interpreted only as suggestive for cardiovascular and respiratory disease. At least a summary of how the PM10 studies are to be included, to bolster the logic of retaining PM10 as a surrogate for course particles, with all the appropriate caveats, should be included. (To try to understand this better I went back to the on-line version of the Final ISA (Dec 2009) and found that figure referred to as 6.2 on page 6.66 is not printed appropriately. This is unfortunate as it represents the IHD data and should be more impressive than figure 6.3 which is CHF).

*b. Has staff appropriately applied this approach in reviewing the adequacy of the current standard (section 3.2) and potential alternative standards (section 3.3)?*

**In contrast to the above introduction, the PM10 data are presented, which would seem appropriate.**

*6. Adequacy of the Current PM10 Standard (section 3.2): What are the Panel's views on the alternative approaches presented for considering the evidence and its uncertainties as they relate to the adequacy of the current standard?*

**Although the conclusion seems to be right, not contained in this section is the logic of why PM10 effects (since there are only suggestive effects for PM10-2.5) translate to a range of potential concerns below the current standard for PM10. All of the discussion seems to focus on the few positive PM10-2.5 studies.**

*7. Indicator (section 3.3.1): What are the Panel's views on the approach taken to considering standard indicator and on staff's conclusion that PM10 remains an appropriate indicator in this review?*

**From middle of page 3.27 to end of section I think the logic is well presented and supported by the data.**

*8. Form (section 3.3.3): What are the Panel's views on the approach taken to considering the form of the standard and on staff's conclusion that revising the form to a 98th percentile form would be appropriate for a 24-hour PM10 standard meant to protect against exposures to thoracic coarse particles?*

**See below, as Staff seems to want to consider these two questions together.**

*9. Level (section 3.3.4): What are the Panel's views on the following:*

*a. The approach taken by staff to identify potential alternative PM10 standard levels, in conjunction with a 98th percentile form, including the weight placed on different studies?*

**Appropriately, more weight is given to the multi-city studies over the single city studies. Although it is not clear that the impact of which studies are chosen to consider in setting an upper bound of 85 ug/m3 is really any better supported than any other number. The 98<sup>th</sup> percentile value of 87 seems to keep all sites below the level where effects are seen with PM10-25, but there are so few studies I certainly do not have a lot of confidence in these numbers. Table 3.2 offers some confidence but not much that there really are differences between 150 and 87, particularly at the higher sites. I think the specific level for consideration will need to be discussed and better logic provided.**

*b. Staff's conclusion that the evidence most strongly supports standard levels around 85 µg/m3?*

**See above.**

*c. The alternative approach to considering the evidence that could support standard levels as low as 65 µg/m3?*

**See above.**

***10. Key Uncertainties and Areas for Future Research and Data Collection (section 3.5):***

*What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?*

**All of the usual suspects are mentioned. The emphasis need to be simply put on more data, with uniform or standardized measures of PM10-2.5.**

**Dr. Helen H. Suh**

**2. Form of the Annual Standard (section 2.3.3.1):**

*a. What are the Panel's views on the additional analyses conducted to characterize the potential for disproportionate impacts on susceptible populations, including low income groups and minorities associated with spatial averaging allowed by the current annual standard?*

*b. In light of these analyses, what are the Panel's views on staff's conclusion that the form of the annual standard should be revised to eliminate spatial averaging?*

The additional analyses and their explanation seem appropriate and provide additional justification in favor of the elimination of spatial averaging. The elimination of spatial averaging makes sense and is appropriate.

**9. Level (section 3.3.4): What are the Panel's views on the following:**

*a. The approach taken by staff to identify potential alternative PM<sub>10</sub> standard levels, in conjunction with a 98th percentile form, including the weight placed on different studies?*

*b. Staff's conclusion that the evidence most strongly supports standard levels around 85 µg/m<sup>3</sup>?*

*c. The alternative approach to considering the evidence that could support standard levels as low as 65 µg/m<sup>3</sup>?*

The approach and considerations in identifying potential alternative PM<sub>10</sub> standard levels is appropriate. The discussion regarding the weight on different studies was clearly and cogently presented. However, even with the various study weighting options, it is not clear from the epidemiological study results that a PM<sub>10</sub> standard level of 85 µg/m<sup>3</sup> protects public health with a sufficient margin of safety from the impacts of coarse particle exposures. The case seems stronger in support of standard level of 65 µg/m<sup>3</sup>.

**Dr. Sverre Vedal**

**3. Alternative Levels (section 2.3.4):** *What are the Panel's views on the following:*

*a. The insights that can be gained into potential alternative standard levels by considering:*

*i. Confidence bounds on concentration-response relationships?*

It was good to see progress made in attempting to use these bounds in focusing on levels of the standard. There are some issues, however. First, it appears that a comprehensive effort was made to identify relevant studies reporting bounds on C-R relationships; this should be stated. Second, it seems that what is stated regarding what these bounds do not indicate (“these analyses do not provide evidence of a concentration below which the confidence interval becomes notably wider and uncertainty in a C-R relationship substantially increases” [p.2-57]) is exactly what they in fact do indicate. It is important to understand not only that the widening of the confidence bounds at lower concentrations is partly due to there being less data at those concentrations (as acknowledged by staff), but that this is itself a source of uncertainty about which we are interested. This does not make these bounds less useful, but in fact provides the information that we want to glean from them. Third, I do not agree with the conclusion that these bounds cannot be used to inform us about alternative levels of the PM NAAQS, even with the limited C-R functions shown. Staff should be encouraged to integrate the information available on relevant C-R confidence bounds with that on study concentration distributions in arriving at a range of levels for consideration.

There are several ways in which one might use findings from epidemiological studies to arrive at a suggested range of levels for consideration. Most ideal would be information on the concentrations that were most influential in generating the health effect estimate in individual studies. Less ideal, but still useful, would be information on the distribution of concentrations in the population sample employed in individual studies. For time series studies, because of the similar number of events (e.g., deaths) per day, this is likely to be the same as the PM concentration distribution; this is probably not the case for cohort studies. Least ideal is using PM concentration distribution metrics, such as those used by staff in arriving at a range of levels for consideration. An attempt should be made, as much as possible, to integrate this latter approach with aspects of the first two approaches, realizing that the reported study findings needed to accomplish this may not be readily available.

*ii. Different statistical metrics that characterize air quality distributions from multicity epidemiological studies?*

Obviously there is a relationship between these distributions and the confidence bounds on the C-R functions, but the relationship is complex. It must be realized that this approach (use of air quality distributions) is not the ideal one, but one that is utilized here because of perceived inadequacies in the use of C-R bounds for this purpose. Selection of concentrations “just somewhat below” the long-term mean concentrations in epidemiological studies is obviously arbitrary, as is use of concentrations “substantially below” these means. Selection of 1SD below the mean is also as arbitrary as any of the proposed percentiles (25<sup>th</sup> or 10<sup>th</sup> percentile, for example). Also, I don't understand why 1 SD is “a more comparable statistical measure across studies” (p.2-65, line 21) than are percentiles. Consideration of alternative percentiles provides for intuitive sensitivity analyses.

*b. Potential alternative annual standard levels based on composite monitor distributions versus maximum monitor distributions?*

This choice is intended to provide for some margin of safety in an indirect way, recognizing that standards use metrics based on maximum concentration distributions. Again, it would be preferable to use the C-R functions themselves for this purpose. I don't understand why using the composite vs. maximum monitor distributions is more robust when all of these data should be available. I'm not sure that defending the use of composite vs. maximal on the basis that the former were what were used in the epidemiology studies is much of an argument, as opposed to arguing in favor of the latter because that corresponds more with the form of the standard.

*c. Use of risk information in informing staff conclusions on alternative annual and 24hour standard levels, including approaches used to assess overall confidence and potential bias in the risk estimates?*

No comments to make at this point.

*d. Staff's conclusion that alternative annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$  are most strongly supported by the available evidence and risk-based information?*

The concentration distribution approach to linking epidemiological findings and proposed revisions to the PM NAAQS has focused attention on concentrations as low as 11 and 10 mcg/m<sup>3</sup>, which are below those supported by the Panel earlier. Also, as I anticipated, endpoints characterized in the ISA as having a "suggestive" causal link with exposure, once incorporated into this analysis, end up influencing the concentrations of interest in considering the standard. I do not think this is appropriate.

*e. Staff's approach of focusing on peak-to-mean ratios to inform the level of a 24-hour standard that would provide supplemental protection to a generally controlling annual standard?*

The argument that 35 mcg/m<sup>3</sup> is a reasonable 24-hr standard because it is at least 2.5 times greater than the suggested annual standards (13 to 11 mcg/m<sup>3</sup>; p.2-73) does not seem to be relevant. The 24-hr standard should be based on health considerations, not observed concentrations. Arguing that considering an annual standard of 11 mcg/m<sup>3</sup> (with a 24-hr standard of 30) retains the annual standard as the controlling standard is no argument at all (p.2-74). Obviously a lower annual standard, whatever it is, will retain its role as the controlling standard. Again, the 24-hr standard should be based on health considerations, not observed concentrations or observed ratios.

*f. Staff's conclusion that consideration should be given to retaining the current 24-hour standard level of 35  $\mu\text{g}/\text{m}^3$  in conjunction with annual standard levels in the range of 13 to 11  $\mu\text{g}/\text{m}^3$ , and that consideration could also be given to an alternative 24-hour standard level of 30  $\mu\text{g}/\text{m}^3$  particularly in conjunction with an annual standard level of 11  $\mu\text{g}/\text{m}^3$ ?*

As noted above (section e.), the latter conclusion is based on a strange argument.

*g. Additional points:*

1. The risk assessment only went down to an annual concentration of 12 mcg/m<sup>3</sup>. The Panel did not recommend doing a risk assessment for lower concentrations.

2. I believe (but could be wrong) that the Panel recommended the hybrid rollback approach to estimated risk reduction and remaining risk rather than the two extreme alternative approaches of proportional (used here) or locally-focused rollbacks.

**4. Key Uncertainties and Areas for Future Research and Data Collection (section 2.5):**

*What are the Panel's views on the areas for future research and data collection outlined in this section, on relative priorities for research in these areas, and on any other areas that ought to be identified?*

This section, as written, has more to do with future research priorities than with uncertainties that influence decisions on revisions to the PM<sub>2.5</sub> NAAQS. What is outlined here is a very broad and ambitious research agenda. It would help to begin this section with a prioritized review of key uncertainties in order to help establish priorities among the suggested research topics. Obviously the key uncertainty is that regarding the concentrations that are most responsible for the observed health effects in the epidemiological studies, and the degree of certainty in effects at the lower concentrations along the C-R relationship. This uncertainty has necessitated the less than ideal use of the distributional measures of concentrations from the epidemiology studies in attempting to make the link between the epidemiological findings and PM NAAQS levels to consider. While this uncertainty is reflected in two (p.2-88 and 2-90) of a long list of recommendations for future research that C-R functions include confidence bounds, this uncertainty should be highlighted. This further motivates the more general point that there should be some prioritizing of research recommendations that are most critical for future revisions to the PM NAAQS, rather than simply the itemization presented here.

With respect to the recommendations listed, these are reasonable and would provide useful information for the NAAQS setting process.