U.S. Environmental Protection Agency
EPA Science Advisory Board (SAB) Staff Office
Clean Air Scientific Advisory Committee (CASAC)
CASAC Ozone Review Panel

Summary Meeting Minutes of the CASAC's Public Advisory Meeting

Thursday, August 24, 2006 – 8:30 a.m. to 6:00 p.m. Eastern Time
Friday, August 25, 2006 – 8:00 a.m. to 2:30 p.m. Eastern Time

***Marriott at Research Triangle Park*, 4700 Guardian Drive, Durham, NC 27703**

Meeting to Conduct a Peer Review of EPA's 2nd Draft Ozone Staff Paper and Related Draft Technical Support Documents (TSDs)

Panel Members: See CASAC Ozone Review Panel Roster – Appendix A

Agenda: See Meeting Agenda – Appendix B

Purpose: The purpose of this meeting was for EPA's Clean Air Scientific Advisory Committee (CASAC) to conduct a peer review of the *Review of the National Ambient Air Quality Standards for Ozone: Policy Assessment of Scientific and Technical Information* (second draft Ozone Staff Paper, July 2006) and three related draft technical support documents: *Ozone Health Risk Assessment for Selected Urban Areas: Draft Report* (second draft Ozone Health Risk Assessment, July 2006); *Ozone Population Exposure Analysis for Selected Urban Areas: Draft Report* (second draft Ozone Exposure Assessment, July 2006); and *Draft Ozone Environmental Assessment: Exposure, Risk and Benefits Assessment* (draft Ozone Environmental Assessment, July 2006).

Attendees:

Chair:	Dr. Rogene Henderson
CASAC Members:	Dr. Ellis Cowling Dr. James Crapo Dr. Frederick Miller Mr. Richard Poirot Dr. Frank Speizer Dr. Barbara Zielinska
Panel Members:	Dr. John Balmes Dr. William (Jim) Gauderman Dr. Henry Gong Dr. Paul Hanson Dr. Philip Hopke Dr. Michael Kleinman Dr. Allan Legge Dr. Morton Lippmann Dr. Maria Morandi

Panel Members: (cont.)	Dr. Charles Plopper Dr. Armistead (Ted) Russell Dr. Elizabeth (Lianne) Sheppard Dr. James Ultman Dr. Sverre Vedal Dr. James Zidek
EPA SAB Staff:	Mr. Fred Butterfield, CASAC Designated Federal Officer (DFO) Mr. Rich Albores, Deputy Director, SAB
Other EPA Staff:	Ms. Lea Anderson, OGC, ARLO Mr. Allen Basala, OAR, OAQPS Dr. Tim Benner, ORD, OSP Ms. Louise Camalier, OAR, OAQPS Dr. Barbara J. George, ORD, NERL Dr. Tara Greaver, ORD NCEA-RTP Mr. Jeffrey Herrick, ORD, NCEA-RTP Mr. John Hannon, OGC, ARLO Dr. William Hogsett, ORD, NHEERL Dr. Jee Young Kim, ORD, NCEA-RTP Dr. Dennis Kotchmar, ORD, NCEA-RTP Dr. Karen Martin, OAR, OAQPS Mr. Lance McCluney, OAR, OAQPS Mr. Thomas McCurdy, ORD, NERL Dr. David McKee, OAR, OAQPS Mr. Dennis Mikel, OAR, OAQPS Dr. Sri Nadadur, ORD, NCEA-RTP Mr. Harvey Richmond, OAR, OAQPS Dr. Mary Ross, ORD, NCEA-RTP Ms. Vicki Sandiford, OAR, OAQPS Ms. Susan Stone, OAR, OAQPS Ms. Lydia Wegman, OAR, OAQPS Dr. Lori White, ORD, NCEA-RTP

Meeting Summary

The discussion followed the issues and general timing as presented in the meeting agenda (Appendix B).

THURSDAY, AUGUST 24, 2006 & FRIDAY, AUGUST 25, 2006

Convene Meeting, Call Attendance, Introduction and Administration

Mr. Fred Butterfield, Designated Federal Officer (DFO) for the CASAC, opened the meeting, called attendance, and welcomed all attendees. He noted that the CASAC is a Federal advisory committee chartered under the Federal Advisory Committee Act (FACA) to provide advice and

recommendations to the EPA administrator. Consistent with FACA regulations, its deliberations are held as public meetings and teleconferences for which advance notice is given in the *Federal Register*. The DFO is present at all such meetings to assure compliance with FACA requirements. Meeting minutes were taken for this meeting. The minutes will be certified by the Clean Air Scientific Advisory Committee (and Ozone Review Panel) Chair and made available on the SAB Web site (www.epa.gov/sab). In addition, a full transcription of this meeting is being taken at the request of the EPA program office to capture the discussions at the meeting; however, the DFO noted that the Science Advisory Board (SAB) Staff Office does not certify the accuracy of transcripts of its meetings. All Panelists have earlier submitted documentation with respect to possible financial conflicts-of-interest, which was reviewed by a SAB staff member prior to the meeting and found to be satisfactory.

Mr. Richard Albores, Deputy Director of the EPA SAB Staff Office, welcomed the CASAC Ozone Review Panel and members of the public, and thanked the members of the Ozone Panel for their efforts.

Purpose of the Meeting

Dr. Rogene Henderson, CASAC and Ozone Review Panel Chair, briefly stated the purpose of the meeting, which is for the Ozone Panel to conduct a peer review of EPA's 2nd Draft Ozone Staff Paper and three related draft technical support documents: the 2nd Draft Ozone Health Risk Assessment; the 2nd Draft Ozone Exposure Assessment; and the Draft Ozone Environmental Assessment.

Overview of Presentation on EPA's 1st Draft Ozone Air Quality Criteria Document

Ms. Lydia Wegman, Director, Health and Environmental Impacts Division, EPA's Office of Air Quality Planning and Standards (OAQPS), within EPA's Office of Air and Radiation (OAR), also thanked the members of the Ozone Panel. She then introduced Dr. Karen Martin, Group Leader of OAQPS Ambient Standards Group, who, along with her staff, gave overview presentations on EPA's 2nd Draft Ozone Staff Paper and the three technical support documents (TSDs). (Hard-copies of OAQPS' presentations are located in FACA file for this meeting.) This presentation included questions-and-answers between Ozone Panel and OAQPS staff members.

Public Comment Period

Mr. Butterfield, CASAC DFO, facilitated the formal public comment period. The following nine (9) individuals offered oral public comments on August 24: Ms. Deborah Shprentz, Consultant, speaking on behalf of the American Lung Association (ALA); Dr. Allen Lefohn, A.S.L. & Associates; Dr. Kent Pinkerton, University of California – Davis, speaking on behalf of the American Thoracic Society (ATS); Dr. Jay Turim, Exponent, Inc., speaking on behalf of the Alliance of Automobile Manufacturers (AAM); Dr. Deborah Dreschler, California EPA, Air Resources Board (CARB); Dr. Annette Rohr, Electric Power Research Institute (EPRI); Dr. David Riker, CRA International, speaking on behalf of the Utility Air Regulatory Group (UARG); Dr. Larry Gephart, ExxonMobil Biomedical Sciences, Inc.; and Mr. Jon Heuss, Air Improvement Re-

source, Inc. (AIR), speaking on behalf of the General Motors Corporation (GMC). (In addition, the following individual offered oral public comments on August 25: Dr. Will Ollison, American Petroleum Institute (API).) (See Appendix C for a summary listing of all public speakers; copies of public commenters' oral statements are located in the FACA file for this meeting.) Ozone Panel members were permitted to asked follow-up questions after each public speaker had finished delivering his or her oral public statement.

Summary of the CASAC Ozone Review Panel's Discussion and Deliberations re: EPA's 2nd Draft Ozone Staff Paper and Related Draft TSDs

Members of the CASAC Ozone Review Panel found the 2nd Draft Ozone Staff Paper improved over the earlier version that had been reviewed as part of a consultation process. However, the Panel did not agree with the EPA staff conclusions that it was appropriate to consider retaining the current NAAQS as an option that would be protective of public health and welfare. Significant points and conclusions from Ozone Panel members' discussions concerning the individual chapters of the 2nd Draft Ozone AQCD and the related TSDs include the following:

- With respect to Chapter 2 (*Air Quality Characterization*), Ozone Panel members commented that this chapter would be improved with the inclusion of a better introduction to the central role of photochemical oxidation reactions as the key reactions governing the behavior of air pollutants in the atmosphere. Panel members pointed-out that ozone is the key indicator of the extent of oxidative chemistry and serves to integrate multiple pollutants, and that oxidation in the atmosphere leads to the formation of particulate matter from SO_2, NO_X, and volatile organic compounds (VOCs) as well as gas-phase irritants (formaldehyde, acrolein, etc.). In other words, while ozone itself has direct effects on human health and ecosystems, it can also be considered as indicator of the mixture of photochemical oxidants and of the oxidizing potency of the atmosphere. However, the applicable section in this chapter only briefly covers the relationship of ozone to other photochemical oxidants. Therefore, Ozone Panelists remarked that it would be beneficial to add a short paragraph outlining the role of ozone and other photochemical oxidants in the atmospheric transformation processes that may results in the formation of more toxic products (both in an outdoor and indoor environment). In addition, Panel members commented that the section on policy-relevant background (PRB) continues to have problems. In particular, while the section briefly cites the results of comparison of different models and measurements, it does not adequately address the uncertainties of the global GEOS-CHEM model, and how these uncertainties are reflected in the health risk analysis. One Panel member pointed-out that, since ozone health effects are observed down to concentrations of the order of 0.04–0.05 ppm, it is important to know how the PRB is related to the considered primary ozone standard and what uncertainties there are in the risk attributed to controllable sources.

- Members of the Ozone Panel judged that Chapter 3 (*Policy-Relevant Assessment of Health Effects Evidence*) in the 2nd Draft Ozone Staff Paper was much improved over the previous draft, adding that EPA staff's efforts to respond to some of the earlier concerns expressed by the CASAC are appreciated. Nevertheless, the Panel pointed-out some inconsistencies and inaccuracies that the Agency still needs to address, which includes the

following: (1) the discussion of measurement error, which various members of the Panel found to be convoluted, confusing, and incorrect; (2) the Ozone Panel's disagreement with staff's conclusion that "the use of routinely monitored ambient ozone concentrations as a surrogate for personal exposures is not generally expected to change the principal conclusions from ozone epidemiological studies"; (3) the lack of adequate support for some statements concerning which individuals are at greatest risk of ozone-induced effects, *e.g.*, those individuals with chronic obstructive pulmonary disease (COPD) and cardiovascular disease (CVD); (4) inconsistencies in the discussion of the ranges for changes in FEV_1 that are considered to be small, moderate, or large for persons with impaired respiratory systems, as well as with in the chapter's discussions relative to ozone effect estimates for COPD mortality; and (6) a misrepresentation of what the Ozone Panel deems to be the relatively-strong and -consistent effect of ozone on emergency department visits for respiratory disease, especially asthma.

- Panelists were pleased to see that Chapter 4 (*Characterization of Human Exposure to Ozone*) of the 2nd Draft Ozone Staff Paper has been revised in response to many of the comments that Panel members made on the first draft, noting that, on the whole, Chapter 4 provides a clear "road map" for what was done to characterize available knowledge about human exposure to ozone in the framework of generally accepted modeling approaches of appropriately selected populations in 12 urban areas of the U.S. While noting that they were pleased to see the reanalysis for 2002 in addition to 2004, the Panel added that it would be helpful to have the estimated exposures for current (2002 and 2004) levels displayed in the associated tables and figures. Ozone Panel members commented that the explicit discussion of the limitations of the Air Pollutants Exposure (APEX) model in terms of variability and the quality of the input data is appropriate and fine as far as it goes, but that there was inadequate consideration of the populations selected for modeling. In addition, Panelists noted that the omission of the elderly — the population most at risk for ozone-associated premature daily mortality — was conspicuous. Furthermore, Ozone Panel members commented that, while the chapter was very good at exposition and clear presentation of modeling results, it was deficient it its discussion of seemingly counterintuitive results, and of a potentially large influence of measurement biases. Additionally, the comparison of measured and modeled concentrations in this chapter is worthy of further analysis and discussion.

- Generally, Ozone Panel found Chapter 5 (*Characterization of Health Risks*) and its accompanying risk assessment to be well done — balanced and reasonably-communicated, while noting that additional text is needed at both the beginning and end of the chapter to put the limited risk assessment into the context of the much larger body of evidence of ozone health effects. Panelists also commented that additional sensitivity analyses seem warranted, noting in particular how essential it is that the sensitivity of the risk assessment to the shape of the dose-response curve for FEV_1 be evaluated. In addition, Panel members offered a suggestion to dealing with the uncertainties surrounding estimation of PRB, particularly as this relates to lung function and mortality. With regard to the controlled human exposure studies, Panel members believe that the selection of changes in pulmonary function expressed as percent change in FEV_1 in children is a fair indicator of an adverse effect at 15% change in all active children; and, in asthmatic children, a 10%

change is indicative of adverse effects. However, that remarked that the presentation of the figures showing these effects needs to be revised to indicate the uncertainties in the results used, particularly at the lower levels of exposure. Panelists also commented that the potential mechanisms whereby these changes are a reflection of such effects as: pain on breathing, partial inflammation of smaller airways, other effects on airways, and potentially triggers for more significant respiratory morbidity, particularly in asthmatic children, are not adequately discussed. In addition, from the perspective of the epidemiological data, the Ozone Panel judged the selection of certain adverse health effects (*e.g.*, respiratory symptoms in moderate/severe asthmatic children (ages birth to 12 years); hospital admissions for respiratory illness among asthmatic children; and premature total non-accidental and cardiorespiratory mortality) for inclusion in the quantitative risk assessment to be appropriate. However, members of the Ozone Panel believe that several other endpoints (for example, respiratory emergency department visits among asthmatics and patients with other respiratory diseases, increased medication usage, and increased symptomatology reported at exposure levels well below the current standard) should also be discussed qualitatively to support the findings that these endpoints indicate that significant adverse health effects are occurring at exposure concentrations well below the current standard.

- With respect to Chapter 6 (*Staff Conclusions on Primary O_3 NAAQS*), Panel members noted that the Agency staff conclusions on the primary (health-related) Ozone NAAQS set-forth two options with regard to revising the level and the form of the standard: (1) retain the current primary eight-hour (8-hr) NAAQS of 0.08 ppm; or (2) consider a reduction in the level of the primary O_3 NAAQS within the range of alternative 8-hr standards included in EPA's exposure and risk assessments (which included a range from 0.064 to 0.084 ppm) with primary focus on an O_3 level of 0.07 ppm with a range of forms from third- through fifth-highest daily maximum. The Ozone Panel's discussion on this chapter focused around the following two points: (1) there is no scientific justification for retaining the current primary 8-hr NAAQS of 0.08 parts per million (ppm); and the primary 8-hr NAAQS needs to be substantially reduced to protect human health, particularly in sensitive subpopulations. Specifically, and after much discussion, the Ozone Panel arrived at the tentative recommendation that the level of the current primary NAAQS for Ozone needs to be revised downward to a range between 0.060 and 0.070 ppm, and that the range of concentration-based forms should be from the 3rd- to the 5th-highest daily maximum 8-hr average concentration. Panel members also noted that it would be helpful to have the estimated exposures for the current (that is, 2002 and 2004) levels displayed in the appropriate figures in this chapter, in addition to only those for just meeting the current standard and alternative more stringent standards.

- As for Chapters 7 (*Policy-Relevant Assessment of Welfare Effects Evidence*) and 8 (*Staff Conclusions on Secondary O_3 NAAQS*) of the 2nd Draft Ozone Staff Paper, Ozone Panel members considered Chapter 7 to be a well-developed and persuasively-presented assessment of the welfare effects of ozone on vegetation that effectively formed the technical basis for the range of secondary standards recommended in Chapter 8. Nevertheless, Panelists commented that the potential for significant propagation of error/uncertainty in the underlying technical documentation draws into question the conclusions drawn by

Agency staff. Ozone Panel members also remarked that, as with the current assessment of human health effects, there also appears to be no safe threshold concentration below which ozone effects on sensitive vegetation are eliminated. A significant majority of the Ozone Panel members agreed with the conclusion of EPA staff in the 2nd Draft Ozone Staff Paper with regard to establishing an alternative cumulative secondary standard for ozone and related photochemical oxidants that is distinctly different in averaging time, form and level from the currently existing or potentially revised 8-hour primary standard. Additionally, the Panel suggested that EPA adopt for the secondary Ozone NAAQS a cumulative seasonal growing standard such as the indices SUM06 or W126 aggregated over at least the three summer months exhibiting the highest cumulative ozone levels and includes the ozone exposures from at least 12 daylight hours. However, Ozone Panel members viewed the three-month growing season W126 index as a potentially more biologically-relevant index than the 3-month growing season SUM06 index, since the W126 index has no absolute minimum ozone concentration threshold and only lightly weights the lower ozone concentrations. Therefore, the Panel tentatively recommended a three-month seasonal W126 that is the approximate equivalent of the SUM06 at 10 to 20 ppm-hr for the secondary Ozone NAAQS.

Closing Remarks

Dr. Rogene Henderson thanked all CASAC Ozone Review Panel members for their participation in this review of the 2nd draft Ozone AQCD and associated technical support documents. She requested that all Ozone Panel members provide their individual inputs for the CASAC's draft letter/report concerning the Panel's review of the 2nd Draft Ozone Staff Paper and the associated draft technical support documents to the "lead discussants" (*i.e.*, the first person named among the lead discussants for each chapter or TSD), with a copy to her as CASAC Chair and to Mr. Butterfield as DFO by no later than Friday, September 1.

In turn, the Chair requested that the "chapter leads" provide compiled, summary paragraph(s) for the draft/letter report — reflecting the comments from their co-lead discussants — to her and the DFO by no later than close of business on Wednesday, September 6. Finally, Dr. Henderson requested that Ozone Panel member furnish their initial or revised individual review comments on both the Staff Paper and the TSDs to both her and the DFO by September 1.

Dr. Rogene Henderson thanked all Ozone Panel members for their participation in this consultation on EPA's 2nd Draft Ozone Staff Paper and related TSDs. Mr. Butterfield, CASAC DFO, also thanks the members of the Ozone Panel, after which he adjourned this meeting at approximately 2:15 p.m. on Friday, August 25.

Respectfully Submitted:

/s/

Fred A. Butterfield, III

Fred A. Butterfield, III
CASAC DFO

Certified as True:

/s/

Rogene F. Henderson, Ph.D.

Rogene F. Henderson, Ph.D.
CASAC Chair

Appendices

Appendix A – Roster of the CASAC Ozone Review Panel

U.S. Environmental Protection Agency
Science Advisory Board (SAB) Staff Office
Clean Air Scientific Advisory Committee (CASAC)
CASAC Ozone Review Panel

CHAIR

Dr. Rogene Henderson*, Scientist Emeritus, Lovelace Respiratory Research Institute, Albuquerque, NM

MEMBERS

Dr. John Balmes, Professor, Department of Medicine, University of California San Francisco, University of California – San Francisco, San Francisco, California

Dr. Ellis Cowling*, University Distinguished Professor-at-Large, North Carolina State University, Colleges of Natural Resources and Agriculture and Life Sciences, North Carolina State University, Raleigh, NC

Dr. James D. Crapo*, Professor, Department of Medicine, Biomedical Research and Patient Care, National Jewish Medical and Research Center, Denver, CO

Dr. William (Jim) Gauderman, Associate Professor, Preventive Medicine, Medicine, University of Southern California, Los Angeles, CA

Dr. Henry Gong, Professor of Medicine and Preventive Medicine, Medicine and Preventive Medicine, Keck School of Medicine, University of Southern California, Downey, CA

Dr. Paul J. Hanson, Senior Research and Development Scientist, Environmental Sciences Division, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN

Dr. Jack Harkema, Professor, Department of Pathobiology, College of Veterinary Medicine, Michigan State University, East Lansing, MI

Dr. Philip Hopke, Bayard D. Clarkson Distinguished Professor, Department of Chemical Engineering, Clarkson University, Potsdam, NY

Dr. Michael T. Kleinman, Professor, Department of Community & Environmental Medicine, University of California – Irvine, Irvine, CA

Dr. Allan Legge, President, Biosphere Solutions, Calgary, Alberta, Canada

Dr. Morton Lippmann, Professor, Nelson Institute of Environmental Medicine, New York University School of Medicine, Tuxedo, NY

Dr. Frederick J. Miller*, Consultant, Cary, NC

Dr. Maria Morandi, Assistant Professor of Environmental Science & Occupational Health, Department of Environmental Sciences, School of Public Health, University of Texas – Houston Health Science Center, Houston, TX

Dr. Charles Plopper, Professor, Department of Anatomy, Physiology and Cell Biology, School of Veterinary Medicine, University of California – Davis, Davis, California

Mr. Richard L. Poirot*, Environmental Analyst, Air Pollution Control Division, Department of Environmental Conservation, Vermont Agency of Natural Resources, Waterbury, VT

Dr. Armistead (Ted) Russell, Georgia Power Distinguished Professor of Environmental Engineering, Environmental Engineering Group, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA

Dr. Elizabeth A. (Lianne) Sheppard, Research Associate Professor, Biostatistics and Environmental & Occupational Health Sciences, Public Health and Community Medicine, University of Washington, Seattle, WA

Dr. Frank Speizer*, Edward Kass Professor of Medicine, Channing Laboratory, Harvard Medical School, Boston, MA

Dr. James Ultman, Professor, Chemical Engineering, Bioengineering Program, Pennsylvania State University, University Park, PA

Dr. Sverre Vedal, Professor of Medicine, Department of Environmental and Occupational Health Sciences, School of Public Health and Community Medicine, University of Washington, Seattle, WA

Dr. James (Jim) Zidek, Professor, Statistics, Science, University of British Columbia, Vancouver, BC, Canada

Dr. Barbara Zielinska*, Research Professor, Division of Atmospheric Science, Desert Research Institute, Reno, NV

SCIENCE ADVISORY BOARD STAFF

Mr. Fred Butterfield, CASAC Designated Federal Officer, 1200 Pennsylvania Avenue, N.W., Washington, DC, 20460, Phone: 202-343-9994, Fax: 202-233-0643 (butterfield.fred@epa.gov) (Physical/Courier/FedEx Address: Fred A. Butterfield, III, EPA Science Advisory Board Staff Office (Mail Code 1400F), Woodies Building, 1025 F Street, N.W., Room 3604, Washington, DC 20004, Telephone: 202-343-9994)

* Members of the statutory Clean Air Scientific Advisory Committee (CASAC) appointed by the EPA Administrator

Appendix B – Meeting Agenda

U.S. Environmental Protection Agency
EPA Science Advisory Board (SAB) Staff Office
Clean Air Scientific Advisory Committee (CASAC)
CASAC Ozone Review Panel

Public Advisory Meeting

Thursday, August 24, 2006 – 8:30 a.m. to 6:00 p.m. Eastern Time
Friday, August 25, 2006 – 8:00 a.m. to 2:30 p.m. Eastern Time

***Marriott at Research Triangle Park*, 4700 Guardian Drive, Durham, NC 27703**

Meeting to Conduct a Peer Review of EPA's 2nd Draft Ozone Staff Paper and Related Draft Technical Support Documents (TSDs)

Meeting Agenda

Thursday, August 24, 2006

8:30 a.m.	**Convene Meeting; Introductions and Administration; and Overview of Meeting Agenda**	Mr. Fred Butterfield, CASAC Designated Federal Officer (DFO)
8:40 a.m.	**Welcome & Opening Remarks from EPA Science Advisory Board (SAB) Staff Office**	Mr. Richard Albores, Deputy Director for Management
8:45 a.m.	**Purpose of Meeting**	Dr. Rogene Henderson, Chair
8:50 a.m.	**Welcome from EPA's Office of Air Quality Planning and Standards (OAQPS); Summary Presentation on 2nd Draft Ozone Staff Paper & Related Draft Technical Support Documents (TSDs)**	Ms. Lydia Wegman, Director, Health and Environmental Impacts Division, OAQPS; Dr. Karen Martin, Group Leader, Ambient Standards Group, OAQPS; OAQPS-ASG Staff
9:30 a.m.	**Public Comment Period**	Mr. Butterfield (Facilitator)
10:30 a.m.	**Break***	
10:45 a.m.	**CASAC Ozone Review Panel Discussion on 2nd Draft Ozone Staff Paper – Chapter 2: *Air Quality Characterization***	Dr. Henderson, Panel Members (Lead Discussant: Dr. Barbara Zielinska)
12:00 p.m.	**Lunch (Hotel)**	
1:00 p.m.	**CASAC Ozone Review Panel Discussion on Chapter 3: *Policy-Relevant Assessment of Health Effects Evidence***	Dr. Henderson, Panel Members (Lead Discussant: Dr. Fred Miller)

*Note: Periodic breaks will be taken as necessary and at the call of the Chair.

Thursday, August 24, 2006 (continued)

2:15 p.m.	**CASAC Ozone Review Panel Discussion on Chapter 4: *Characterization of Human Exposure to Ozone;* Draft Ozone Exposure Analysis TSD; and Draft OAQPS Staff Memo on Uncertainty Analysis**	Dr. Henderson, Panel Members (Lead Discussants: Dr. Mort Lippmann, Dr. Miller)
3:30 p.m.	**Break***	
3:45 p.m.	**Continue CASAC Ozone Review Panel Discussion on Chapter 4, *etc.***	Dr. Henderson, Panel Members
4:15 p.m.	**CASAC Ozone Review Panel Discussion on Chapter 5: *Characterization of Health Risks*; and Draft Ozone Health Risk Assessment TSD**	Dr. Henderson, Panel Members (Lead Discussants: Dr. Frank Speizer, Dr. Henry Gong)
5:55 p.m.	**Summary, Wrap-Up and Next Steps**	Dr. Henderson
6:00 p.m.	**Adjourn Meeting for the Day**	Mr. Butterfield

Friday, August 25, 2006

8:00 a.m.	**Reconvene Meeting**	Mr. Butterfield
8:05 a.m.	**Re-cap of Previous Day's Meeting**	Dr. Henderson
8:10 a.m.	**Public Comment Period****	Mr. Butterfield (Facilitator)
8:15 a.m.	**Additional OAQPS Comments**	Dr. Martin
8:30 a.m.	**CASAC Ozone Review Panel Discussion on Chapter 6: *Staff Conclusions on Primary O_3 NAAQS***	Dr. Henderson, Panel Members (Lead Discussant: Dr. James Crapo)
9:15 a.m.	**Break***	
9:30 a.m.	**Continue CASAC Ozone Review Panel Discussion on Chapter 6**	Dr. Henderson, Panel Members
10:15 a.m.	**CASAC Ozone Review Panel Discussion on Chapter 7: *Policy-Relevant Assessment of Welfare Effects Evidence*; and Draft Ozone Environmental Assessment TSD**	Dr. Henderson, Panel Members (Lead Discussants: Dr. Ellis Cowling, Mr. Richard Poirot)
11:45 a.m.	**Lunch (Hotel)**	

Notes:

*Periodic breaks will be taken as necessary and at the call of the Chair.

**The purpose of the public comment period on the second day of the meeting is to permit any members of the public who were unable to provide their oral comments on the first day with an opportunity to do so.

Friday, August 25, 2006 (continued)

12:45 p.m.	**CASAC Ozone Review Panel Discussion on Chapter 8: *Staff Conclusions on Secondary O_3 NAAQS***	Dr. Henderson, Panel Members (Lead Discussants: Dr. Cowling, Mr. Poirot)
2:15 p.m.	**Summary, Wrap-Up, Next Steps and Closing Remarks**	Dr. Henderson
2:30 p.m.	**Adjourn Meeting**	Mr. Butterfield

Appendix C –List of Public Speakers

List of Public Speakers

U.S. Environmental Protection Agency ❖ EPA Science Advisory Board (SAB) Staff Office
Clean Air Scientific Advisory Committee (CASAC) Ozone Review Panel

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#	Speaker's Name	Organizational Affiliation(s)	Organization(s) Represented (i.e., comments offered on behalf of)
1	Ms. Deborah Shprentz	Consultant	American Lung Association (ALA)
2	Dr. Allen Lefohn	A.S.L. & Associates	same
3	Dr. Kent Pinkerton*	University of California – Davis	American Thoracic Society (ATS)
4	Dr. Jay Turim*	Exponent, Inc.	Alliance of Automobile Manufacturers (AAM)
5	Dr. Deborah Dreschler*	California EPA, Air Resources Board (CARB)	same
6	Dr. Annette Rohr	Electric Power Research Institute (EPRI)	same
7	Dr. David Riker	CRA International	Utility Air Regulatory Group (UARG)
8	Dr. Larry Gephart	ExxonMobil Biomedical Sciences, Inc.	same
9	Mr. Jon Heuss*	Air Improvement Resource, Inc. (AIR)	General Motors Corporation (GMC)
10	Dr. Will Ollison	American Petroleum Institute (API)	same

*Note: Will present oral comments via teleconference (phone) line.