Federal Advisory Committee Act

Clean Air Act Advisory Committee

Meeting Summary

September 26-27, 2018
The Holiday Inn, Ballston
Arlington, VA

Opening Session

Mr. Larry Weinstock with the EPA's Office of Air Policy and Program Support called the meeting to order at 1:00 pm on September 26, 2018. Mr. Weinstock welcomed everyone to the meeting and thanked attendees for taking the time to attend this meeting. Mr. Weinstock introduced himself as the new Clean Air Act Advisory Committee (CAAAC) Designed Federal Officer (DFO). Mr. Weinstock will be acting as the liaison between the CAAAC board and the Environmental Protection Agency (EPA). The purpose of the meeting is to present and discuss the Office of Air and Radiation (OAR) initiatives. More information on the purpose of the committee is available on the CAAAC website (https://www.epa.gov/caaac). The CAAAC website will also include all the presentations that will be given today. A summary of the meeting will be available on the CAAAC website within 90 days. Mr. Weinstock acknowledged that in addition to the folks attending the meeting in person, there are additional people joining via the phone. Per the Federal Advisory Committee Act, or FACA, which the CAAAC is chartered under, there will be an opportunity for public comment at the end of the meeting.

Mr. John Shoaff, the Director of the EPA's Office of Air Policy and Program Support introduced himself and noted that he will be the facilitator of the group today and tomorrow. Mr. Shoaff thanked everyone for being present and asked the committee members to introduce themselves. The list of meeting attendees is provided as Attachment A to this summary. The meeting agenda is provided as Attachment B.

Presentation: AirNow Update

Mr. Phil Dickerson with the EPA's Office of Air Quality Planning and Standards (OAQPS) provided a summary of the AirNow system, which Mr. Dickerson has been involved with since the inception of the system in 1998. AirNow is a year-round 24/7 system that provides real-time ozone and particle data for 50 states, six Canadian Provinces, and 24 U.S. National Parks. Based on data originating from state and local agencies, the system provides next-day Air Quality Index (AQI) forecasts for nearly 500 cities. Mr. Dickerson noted that several audiences are served by this system, including the public, governmental agencies, emergency responders, and researchers. He noted that AirNow receives much higher viewer volumes during wildfire events, as realitme data from the U.S. Forest Service is shown through the system. The EPA is working with other countries to share data and to help them develop systems similar to AirNow. Mr. Dickerson showed the Department of State monitors that report to the AirNow

system and added that the Village Green benches also report to AirNow. Mr. Dickerson noted that the AirNow.gov website has recently been redesigned, and he gave a live demo of the newly updated AirNow website. He highlighted the fact that the new site immediately displays local Air Quality Index meter, which was based on research to determine what users wanted to see and how they used the former site.

Comments and discussion

A CAAAC member asked if the new system allows the option to compare two locations. Mr. Dickerson answered that the system allows for comparison through the AirCompare page. He also clarified that the data comes from the state and local agencies who run the monitors, and those state and local agencies determine which monitor's data to display on the AirNow site for a specific location. Mr. Dickerson illustrated the current site with the dial display for Arlington, Virginia. He showed that information is provided on the bottom of the page indicating which state and local agencies submitted the data for that site.

Mr. Gary Jones (Specialty Graphic Imaging Association) asked whether the system would show graphs of both particulate matter (PM) and ozone concentrations. Mr. Dickerson replied that the system will only show graphs of one pollutant at a time.

Mr. Robert Morehouse (Air Permitting Forum) asked what the system shows if there is no monitor near the user and how far the monitors' reach is. Mr. Dickerson responded that if data is requested for a location over 50 miles from a monitor, the state page will be shown.

Mr. Morehouse asked how far back the historical data goes. Mr. Dickerson replied that a user can only look back one to two years on AirNow, and to get data going further back, the user would need to go to the EPA's Air Quality System website.

Mr. Morehouse asked how the AirNow system defines "good," "poor," etc. air quality and whether the ratings were related to the ambient air standards. Mr. Dickerson remarked that AirNow uses NowCast, which relates the hourly measurements from the monitors to the air quality standards. He also noted that the hours are weighted depending on how fast the concentrations are changing.

Mr. Shoaff asked whether there had been any surprises from the website refresh. Mr. Dickerson responded that the biggest issue they had heard about was that people's bookmarks for the old site no longer work.

Ms. Patty Strabbing (Chrysler) asked whether AirNow will incorporate any new monitors that are set up. Mr. Dickerson replied that states can add new monitors whenever they want, and the AirNow system will automatically use the new monitors.

Presentation: Tools for State and Local Government

Ms. Julie Rosenberg (EPA) was the first of a group of three presenters to provide an overview of energy efficiency (EE) and renewable energy (RE) tools and resources the EPA has

developed for state and local governments to use to achieve their air quality goals. Ms. Rosenberg noted that there are 26 state EE Resource Standards, 29 state Renewable Portfolio Standards, and over 80 cities and counties have committed to using 100 percent renewables. Many state and local agencies have EE/RE policies and programs for a variety of reasons, including emissions, energy, economic, public health and sustainability goals. Ms. Rosenberg emphasized that quantification of emissions impacts from EE/RE is an area that state and local agencies have requested assistance with, and the focus of the EPA's recent tools development work has been on quantification tools. The tools and resources the EPA has developed in this context are free and non-proprietary. Two of these tools include the Avoided Emissions and geneRation Tool (AVERT) and the CO-Benefits Risk Assessment (COBRA) health impacts and screening and mapping tool, which can be used in conjunction with each other.

Ms. Robyn DeYoung (EPA) gave a summary of AVERT, the tool the EPA has created to quantify the emissions benefits of EE/RE programs. The EPA found that there are other tools available, however these include basic methods, such as the Emissions & Generation Resource Integrated Database (eGRID), which isn't appropriate for use in Clean Air Act Plans, and sophisticated energy models that require energy modeler expertise and licensure fees.. To fill the gap between the basic methods, which might not provide enough detailed information , and sophisticated methods, which require more time to run and monetary resources and lots of input data, the EPA created an intermediate method. This system, AVERT, is an Excel workbook that uses historical hourly emission rates and basic user inputs about energy saved from EE programs or the total capacity of RE installations to estimate the emissions avoided through the EE/RE programs. AVERT 2.0 is accessible using a web interface and is available on your mobile phone as well. . Tools and training for AVERT is available at https://www.epa.gov/avert.

Ms. Denise Mulholland (EPA) continued the presentation with an overview of COBRA. The COBRA tool provides insight into the health impacts associated with EE/RE programs by estimating illnesses and deaths avoided, as well as the economic value associated with emission decreases. It is a screening-level tool that can be applied by a range of different users, including financial institutions, state regulators, utilities, etc. According to Ms. Mulholland, while there are usually good estimates associated with the costs of EE/RE programs, the benefits of these programs are difficult to estimate and fewer tools are available to assist with these analyses. The COBRA tool is available at https://www.epa/gov/COBRA.

Ms. DeYoung concluded the presentation of the EPA-developed EE/RE tools by conducting a phone demonstration of AVERT. She noted that the AVERT results (annual emissions reductions) can be directly input into COBRA.

Comments and discussion

Mr. Frank Prager (Xcel Energy) stated that his company does a great deal of resource planning and sophisticated analysis and expressed concern about the public comparing the results of AVERT to the results of the more detailed analyses that uses energy models. Specifically, Mr. Prager noted concern with the accuracy of the results and the age of the data used by the model. Ms. DeYoung acknowledged that every model is a projection of a what-if scenario and

there are limitations to AVERT. Those limitations are stated in the materials about AVERT. In terms of what it should and should not be used for, e.g., it should not be used for more looking more than five years in the future and integrated resource planning that looks at the impacts of new electric generators coming online. She noted that the AVERT 2.0 web edition is a good screening tool and gives good "ballpark" estimates, but this should be followed by more rigorous analysis, if needed for Public Utility Commission integrated resource planning needs. Mr. Prager stressed that it is important for the EPA to communicate the limitations of the AVERT tool, especially to policy makers.

Mr. Bob Wyman (National Climate Coalition) commented that if the proposal for the power sector moves forward, state and local agencies will be making plans. He asked whether these tools could be used to track data and allow trading across states for power sector emissions. Ms. Rosenberg responded that the EPA had not thought about the tools being used in that way, but that they would examine this as a possible use.

Mr. Dan Greenbaum (Health Effects Institute) asked how AVERT and COBRA compare to BenMAP – the environmental Benefits Mapping and Analysis Program (https://www.epa.gov/benmap). He also stated that with COBRA, the sense of uncertainty in the results is lost, and he asked how the uncertainties are presented. Ms. Mulholland indicated that the tools correlate closely with BenMAP but noted that COBRA does not include ozone as a pollutant. She also responded that COBRA does try to convey uncertainty and how the results should be used.

Mr. Morehouse asked whether COBRA has information on its limitations discussed somewhere. He added that the National Air Toxics Assessment (NATA) highlights the limitations of its data and suggested that something similar could be done for COBRA. Ms. Mulholland indicated that there is a user manual and that all assumptions used to develop the tool are available from the user manual. She added that it may also be possible to include some of this information on the model output pages.

Mr. Dave Foerter (Ozone Transport Commission) noted that the EPA Clean Air Markets Division (CAMD) data is for units of 25 megawatts (MW) or larger and he asked how the smaller units (less than 25 MW) are dealt with in the tools. Ms. DeYoung indicated that smaller units are currently not included because the EPA does not have hourly information for those units. However, users can add that data to the model if they have the information available.

In the context of the COBRA outputs, Mr. Steven Marcus (Rutgers University) commented that prevalence rather than incidence provides a better idea of the health effects. Further, Mr. Marcus observed that the only health impacts related to children represented in the material the EPA presented was infant mortality. He stated that due to this, the health effects to children are most likely under-represented.

Ms. Roxanne Brown (United Steelworkers) asked how many people are using the tools and additionally asked if the only renewable projects in AVERT are wind and solar installations. Ms. DeYoung said that there have been more than 1,200 AVERT downloads and 80 citations

in public reports and articles of use of the tool. There have been around 1,000 downloads for COBRA, according to Ms. DeYoung. In response to Ms. Brown's first question, the EPA indicated that data for wind and solar projects had been entered into the tool, making the results for those projects easier to obtain, but the tool has the capability to do other things, such as biomass, but that would require more user input.

Ms. Sara Hayes (American Council for an Energy-Efficient Economy) expressed that she has used this tool many times and noted that she has used the tools in combination with other models and also in comparing projects across cities.

Presentation: Overview of new SAFE standard

Mr. Bill Charmley (EPA) presented an overview of the new Safer Affordable Fuel-Efficient (SAFE) Vehicles rule (presentation available at https://www.epa.gov/caaac). On August 2, 2018, the EPA and the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) issued a notice of proposed rulemaking for the SAFE Vehicles rule for model years 2021-2026 passenger cars and light-trucks. Mr. Charmley showed a graph highlighting the improvement in light-duty vehicle CO_2 emissions rates over time, which started in the mid-1970's. Mr. Charmley noted that this trend is expected to continue with the EPA's current CO_2 standards through 2025. Mr. Charmley next gave an overview of the midterm evaluation process. The 2012 rule which finalized standards for model years (MY) 2017-2025 included a commitment to conduct a mid-term evaluation of whether the standards for model years 2022-2025 remained appropriate. An initial determination was made in January 2017 that the 2022-2025 standards remained appropriate, but this determination was reconsidered, and the EPA determined in April 2018 that the 2022-2025 standards are not appropriate. The EPA and NHTSA worked together to set appropriate standards, and proposed the SAFE Vehicles rule in August 2018. This proposed rule would reduce the stringency of MY2021-2026 to the MY2020 levels. The EPA is also proposing to withdraw the Clean Air Act waiver for California's greenhouse gas (GHG) and zero emissions vehicle standards. Mr. Charmley indicated that the existing EPA CO_2 standards average around a 4.7 percent stringency increase from model years 2020-2025, and several regulatory alternatives to this level of stringency were discussed in the proposal, with requests for public comment. The impacts associated with the proposed SAFE Vehicles standards are estimated to be a national net benefit of $290 billion. Mr. Charmley highlighted the EPA's request for comment on a number of topics, including incentives and credits designed to assist in providing manufacturers flexibility in meeting the standards. Mr. Charmley noted that there were three public hearings on the rule and that the public comment period ends on October 26, 2018.

Comments and discussion

Mr. Mitch Hescox (Evangelical Environmental Network) asked whether there were increased health risks associated with the decrease in stringency and whether these were assessed. He also asked why this rule included provisions to not allow California to set more stringent standards. Mr. Charmley responded that as fuel efficiency increases, there is also an increase in driving, which leads to more pollution upstream associated with more refining activities. He noted that more information about this is in the regulatory impact analysis for the rule. Mr.

Hescox commented that with an increase in CO_2, there would likely be an increase in other pollutants also, and this would seem to result in more deaths. Mr. Charmley replied that the estimate of 1,000 deaths avoided is due to cheaper vehicles being available, which increases fleet turnover and to quicker use of vehicles with enhanced safety features. He noted that these 1,000 deaths avoided dwarfs the health impacts associated with pollution increases. Mr. Bill Wehrum (EPA) added on the issue of California standards, that while the Clean Air Act (CAA) is clearly an exercise in cooperative federalism, cooperative federalism was not intended by congress to apply to this rule (i.e., the SAFE rule). In this case, congress says that states are preempted from vehicle regulation. While historically California has been allowed to create more stringent standards due to its local air quality problems, the case here is not unique to California. There is nothing unique or extraordinary with respect to greenhouse gas (GHG) emissions in California.

Mr. Wyman commented that there are very different views on the modeling and cost analyses done for this rule. He also remarked that this rule is not in line with what the automakers are currently doing and trying to do for future models. He expressed that the previous rulemaking included coordination with the regulated community, and the subsequent proposed rule benefitted greatly from that process.

Ms. Nancy Kruger (National Association of Clean Air Agencies) asked where the technical analysis is for the proposal. Mr. Wehrum indicated that there is one for the midterm evaluation and that it was concluded for the midterm evaluation that the fundamental assumptions are different. The price of gas is different, vehicle choice has changed, and the use of electric cars is not as high as predicted. Based on that, former Administrator Scott Pruitt determined that another rulemaking was needed. The EPA is proposing a range of options and is open to comments, Mr. Wehrum emphasized. Ms. Kruger noted that there is no Technical Assessment Report or an opportunity for stakeholders to provide input on the analysis. Mr. Wehrum replied that the Agency is doing things differently now and following a more traditional path with this rulemaking. The Agency has had a lot of conversations with different parties and believes that the best process is to conduct the analysis, then draft the reconsideration proposal rather than proceed through a regulatory negotiation-like process that had been followed in the past. Ms. Kruger stressed that a 60-day comment period does not allow for robust involvement from the regulated community and stakeholders. In response, Mr. Wehrum stated that essentially the comment period was longer, attributing an additional 3 weeks of comment time when the proposal was available online before being published in the Federal Register. Mr. Wehrum added that the rule is complex, but that NHTSA has to put the Corporate Average Fuel Economy (CAFE) standards into place ahead of the model year, and there is not an unlimited amount of time available.

Mr. Steve Flint (New York Department of Environmental Conservation) commented that it was nice to have the chance to talk here for more than the three minutes that was allotted at the public hearings for the SAFE Vehicles rule. He indicated that this is a joint rulemaking between EPA and NHTSA, but he is concerned that the regulation is dominated by NHTSA. Mr. Flint asked how the EPA expects to meet the endangerment findings and criteria pollutant requirements. Mr. Wehrum expressed that under the CAA there is a lot of flexibility, and the EPA needs to give adequate weight to all the considerations. The ever-increasing stringency of

pollution standards makes vehicle costs increase, and people are driving older, less safe cars. We are the EPA, Mr. Wehrum asserted, but the Agency needs to consider all the costs and benefits, including highway safety. He added that regardless of how the stringency of the standards change, GHG emissions will continue to be reduced.

Ms. Brown spoke from the steel workers and jobs perspective, indicating that the steel workers represent the largest union in the automobile sector. From her group's perspective, they see existing standards driving investments into domestic facilities. Since 2008 there has been an increase in jobs, and Ms. Brown indicated that the steel workers would like to see the domestic automaker industry continue this trend. Mr. Charmley responded that the EPA did try to quantify the jobs impacts, but he noted they had difficulty in quantifying the impacts on innovation.

Mr. Adrienne Shelley (Air Alliance Houston (via phone)) echoed some earlier comments made, that it seems certain effects and impacts associated with the proposed rule are not present in the material today. For instance, Mr. Shelley asked what the co-pollutant effects were and specifically what the co-pollutants (e.g., nitrogen oxides (NO_x)) impacts are in non-attainment areas.

Presentation: Overview of Affordable Clean Energy (ACE) Proposal

Mr. Kevin Culligan (EPA) spoke next on the Affordable Clean Energy (ACE) proposal (presentation available at https://www.epa.gov/caaac). The ACE rule empowers states to reduce CO_2 emissions and would replace the Clean Power Plan (CPP). There are several components to the rule, which are related to reducing emissions from coal-fired power plants. An Advanced Notice of Proposed Rulemaking for this rule was published in December 2017 and received over 270,000 comments. Mr. Culligan displayed a graph of emissions trends in the power sector, showing that CO_2 emissions have been dropping since 2005 due to market forces, technology improvements and policy changes. He noted that the ACE rule would continue this trend, pushing CO_2 power sector emissions to about 34% less than 2005 levels. He noted that the ACE clarifies EPA and state roles and works via four main actions: defining the best system of emission reduction (BSER), listing candidate technologies, providing adequate time and flexibility to develop state plans, and revising the New Source Review (NSR) permitting program. For the two first actions, the EPA determined the BSER and proposed a list of candidate technologies states would need to consider in establishing performance standards. The ACE rule would require states to develop and submit plans to the EPA for the standards of performance they would establish. The rule includes timelines for state plan submittals and allows states to include compliance flexibility in their plans. On NSR, the rule proposes new applicability tests to determine whether a change at a power plant is a "major modification" and would give states the option to adopt an hourly emissions increase test along with the annual emissions test required by NSR. The costs and benefits of the rule are explained in the regulatory impact analysis (RIA). The RIA includes different scenarios to account for the flexibility of the rule but shows that CO_2 emissions would decrease under each scenario. The costs of the rule are estimated to be $3.4 less than the CPP costs. Mr. Culligan noted that the comment period deadline for the proposal is October 31, 2018, and the date for the public hearing is set for October 1, 2018.

Comments and discussion

Mr. Hescox asked what the health costs are related to the ACE rule and questioned the 1,400 additional premature deaths figure that are predicted for this rule over that of the CPP, which he said is an incredible loss of life. Mr. Culligan stated that the emissions reductions predicted for the CPP cannot be achieved because the EPA does not have the authority to require all the elements of the CPP. He also said that the rule is really about GHG emissions and added that the EPA has more authority to address pollutants outside of CAA section 112(d) through other programs. Mr. Hescox agreed, but he stated that the EPA has not addressed those co-pollutants through the other programs. He remarked that the mission of the EPA is to protect public health and the environment, and he thinks it is troubling that the EPA is not fulfilling that mission with rules like the ACE. Mr. Culligan noted that the biggest driver to particulate emissions is sulfur dioxide (SO_2), and emissions of this and other pollutants have already been significantly reduced through many other EPA programs. He added that the EPA is continuing to address all of these pollutants through other programs.

Mr. Prager commented that he is glad to have a replacement rule and believes that having a replacement rule is the right decision. Mr. Prager stressed that the EPA should consider the issue of state authority and take a broader perspective on this issue. He stated that the EPA should consider allowing states the flexibility to go beyond the facility fenceline. Some of the options, such as heat rate improvements will force some owners and operators to close plants. However, he said that if broader, beyond-the-fenceline strategies are allowed, there are other opportunities, like using more renewable energy, to reduce emissions. Mr. Culligan responded that while this and some other policy suggestions seem like good ideas, the EPA must act within its CAA authority.

Mr. Dan Nickey (Iowa Waste Reduction Center) asked if the EPA has considered the impact of the rule on small businesses. Mr. Culligan indicated that the EPA typically does an analysis under the Small Business Regulatory Enforcement Fairness Act (SBREFA) when the EPA is directly regulating small businesses, but one was not done for this rule since the EPA is not the direct regulator.

Mr. Bob Wyman echoed Mr. Prager's suggestions in terms of state flexibility and incorporating portfolio programs that extend across states. He noted that states have broad authority in the context of State Implementation Plans (SIPs) to do outside-the-fenceline requirements. Mr. Culligan agreed that those could be good programs for states to implement, but how that relates to BSER is unknown and whether BSER must relate to that are currently two unanswered questions.

Mr. Tomás Carbonell (Environmental Defense Fund) asserted that the ACE rule is unlawful and that his organization will be submitting comments. He also asked if the effects the BSER will have on the NSR program have been evaluated. Mr. Culligan replied that the EPA focused on heat rate improvements, particularly with where they thought they would apply and the likely actions that would be taken to get these improvements. He stated that the EPA would welcome comments on this, as it is not clear that there are any other types of projects to consider.

Mr. Greenbaum commented that there have been many rules and programs that have reduced emissions and provided health benefits. He stated that emissions and health benefits should be considered in a broad context in terms of determining which types of stationary sources are still causing problems and how those should be addressed. Mr. Wehrum responded that the EPA "keeps score" by seeing who is meeting the National Ambient Air Quality Standards (NAAQS) and who is not. He also said that there is a paradox here, because they predict that there will be health benefits by reducing emissions below the levels of the NAAQS, which are supposed to be the levels that protect human health. He noted that a dialog has started within the EPA to reconcile these two thoughts.

Mr. Morehouse commented that on NSR, it would be best to design the program so that all industries, not just electric utilities, will do plant upgrades without the NSR problems that are being addressed in the ACE rule.

Ms. Lynne Liddington (Knox County Health Department) said that her county has endured non-attainment and came into attainment due to the NOx State Implementation Plan (SIP) call. She noted that there are other issues contributing to non-attainment, like transport. She stated that her area wants to stay in attainment, and she hopes that the EPA will develop rules that make continued attainment a possibility.

Presentation: OAR Overview & Update on Priorities

Mr. Wehrum presented an overview and update on priorities of the EPA's Office of Air and Radiation (presentation available at https://www.epa.gov/caaac). Mr. Wehrum indicated that this presentation is meant to be a conversation starter and that he was interested in questions and comments from the CAAAC. Mr. Wehrum pointed to a graph of air quality trends from 1970 until today, showing that there has been a huge decline in emissions in this time period. He stated that as debates about emissions and health continue, the significant progress that has been made should not be forgotten. In terms of the ACE and SAFE rules, Mr. Wehrum strongly urged CAAAC members to submit comments on these rules. Comments on ACE are due by October 31, 2018 and by October 23, 2018 for the SAFE rule. Other OAR priorities include the oil and gas New Source Performance Standards (NSPS), the NAAQS, the Mercury and Air Toxics Standards (MATS), and NSR and permitting reform. In terms of the oil and gas rule, the targeted improvements proposal was published on September 11, 2018. The proposal addressed near-term issues and additional fixes, and the EPA will take a hard look at the comments that are currently coming in to the Agency. With respect to the NAAQS, this is always a big issue according to Mr. Wehrum, and the Agency is conducting an accelerated review of the 2015 ozone standard. Mr. Wehrum added that the EPA is trying to provide additional help to states under the SIP reform. Another OAR priority is the Mercury and Air Toxics Standard (MATS) rule, which the Agency is reviewing. Mr. Wehrum concluded his overview of OAR priorities by indicating that all the work that has been discussed takes a lot of effort, but that he feels that there has been a lot of progress made.

Comments and discussion

Mr. Mike Rochford (Caterpillar) asked about the status is of the once-in-always-in (OIAI) policy. Mr. Wehrum explained that a memo was issued saying that the OIAI policy no longer applies. He noted that the memo also said the EPA would do a rulemaking to reflect this policy, and he believes the proposal should be published sometime this fall.

Mr. Prager asked about the status of the Regional Haze program. In response, Mr. Wehrum replied that the regional haze program was significantly misapplied under the previous administration. He stated that the purpose of the program is to improve visibility in national parks. The EPA is currently working on three things to address regional haze: (1) resolve the controversy from the first planning period, (2) meet with states and other agencies to get feedback on whether there were problems for the first planning period, and (3) apply a new perspective to implementation of the program based on the years of experience since 1998 when the program began. Mr. Wehrum added that the Administrator signed the Regional Haze Reform Roadmap memo a few weeks ago.

Ms. Mary Peveto (Neighbors for Clean Air) commented that she questions the assumptions made in the SAFE rule regarding pollution vs. traffic fatalities in determining the overall impacts of the rule. She also expressed concern that while there have been overall improvements in air quality, there are still areas that have not seen as much progress, including Environmental Justice (EJ) communities and areas impacted by urban air toxics. She also noted that the states do rely on the EPA to develop and implement technology-forcing standards.

Mr. Tim Hunt (American Forest and Paper Association and American Wood Council) thanked the OAR Assistant Administrator for the direction the Agency is taking on air permitting and NSR reform, but he thought an additional area for improvement would be with the modeling aspects of the program and suggested that some modeling assumptions could be systematized. Mr. Wehrum responded that the EPA is seeking a balance with the tools that support decision making, in that they should provide information about potential scenarios and impacts without being overly conservative. The EPA is trying to make NSR be a better tool under the CAA to achieve results that make sense.

Mr. Jones asked if the EPA's direction on the once-in-always-in policy would be expanded to other pollutants, such as for ozone NAAQS implementation. Mr. Wehrum said that the Agency has not thought of this policy extending beyond the MACT program, but he would be interested to hear about other programs that may have similar issues. With respect to ozone NAAQS implementation and state flexibility, the EPA is interested in empowering states to develop their own solutions to ozone issues, such as interstate transport. The role of the EPA in this could be to provide state agencies with analytical tools so they may can make their own rules and policies with confidence.

Mr. Jones asked a follow-up question regarding ozone and whether the EPA is working on the issues of foreign transport and background concentrations. Mr. Wehrum replied that the EPA is working on background concentrations, including background concentrations from international transport and true background, like wildfires. He noted that most of the causes of background concentrations, such as wildfires, are covered under the exceptional events provisions. However, some areas of the country, like Texas, are impacted by foreign transport.

Ms. Mary Uhl (Western States Air Resources Council) expressed that she appreciated seeing the Regional Haze Road Map. Ms. Uhl asked if there is any way the Regional Haze Map could be brought into OAR priority for amendments, stating that it would be better to not have guidance be issued at the end of the process, since states are already working on their analyses. Mr. Wehrum acknowledged the request and stated that the Agency is aware of the schedule and is moving as expeditiously as possible.

Mr. Ted Steichen (American Petroleum Institute) stated that there is a lack of transparency in terms of the progress being made on the NAAQS outside of the EPA's Office of Air Quality Planning and Standards. He asked whether the Science Advisory Board or the Clean Air Scientific Advisory Committee (CASAC) had been consulted. In Mr. Steichen's opinion, there are things missing regarding the NAAQS review process and it is unclear how the deadline on ozone and particulate matter (PM) will be met. Mr. Wehrum indicated that former EPA Administrator Mr. Scott Pruitt made it clear that the ozone standards will get done on time, and the current Acting Administrator, Mr. Andrew Wheeler, is supportive of this. According to Mr. Wehrum, the EPA is also going to try to catch the PM standards up to the ozone standards timeline, which may require doing things a little differently within the Agency, such as potentially not going to the CASAC so many times in the rule development process.

Mr. Morehouse mentioned that the Office of Management and Budget (OMB) has had some rules in the review process for a long time and asked whether the EPA was working with them to try to smooth this process. Mr. Wehrum responded that the EPA has given the OMB many rules to review, so the long review time has not been due to disputes but rather that the OMB has so many rules to review.

Mr. Flint commented that it is better to get rules done correctly rather than quickly (referring to the NAAQS). He also commented that the information available so far on how to handle transport is inadequate. Mr. Wehrum replied that it is imperative that the EPA get the NAAQS done correctly, but there are also deadlines for the NAAQS reviews that must be met. He stated that the EPA may need to develop a better process to get these reviews done on time.

Public Comments

Mr. Shoaff asked if there were any comments from the audience, and there were no questions or remarks from the public.

Meeting Adjourned

The meeting was adjourned for Wednesday, September 26, 2018, and was scheduled to resume on Thursday, September 27, 2018 at 8:30am.

Welcome to Day 2 (September 27, 2018)

Mr. Shoaff introduced the second session of this two-part meeting at 8:30am on September 27, 2018. The topic for this session of the meeting was presentations and discussion of air quality

sensors. He noted that a conference on the subject was recently held in Oakland, California.[1] In addition to different EPA presentations on the topic and 5-minute lighting round presentations by select CAAAC members, there is also a list of six specific charge questions (see Attachment B) the EPA sought feedback on.

Presentation: Sensors Overview

The first presenter on air sensors was Ms. Kristen Benedict (EPA) who gave the EPA's perspective on air sensors (presentation available at https://www.epa.gov/caaac). Ms. Benedict described the EPA's traditional process of collecting air quality data, which involves collecting, storing, sharing and communicating about the data collected. She stated that the EPA is going to continue gathering data in this way but will also monitor the changing landscape of new participants monitoring air quality. As an example of the changing landscape, Ms. Benedict showed the ambient PM continuous monitoring network in October 2016 alongside a sensor vendor map of PM monitoring in August 2018, and she showed a brief video showing a non-government organization collecting data from mobile platforms in California. According to Ms. Benedict, air sensors are often broadly grouped into three different categories: low-cost, mid-tier and regulatory-grade instruments. The topic of air sensors is generating a lot of interest both domestically and internationally, and Ms. Benedict referred to the recent 2018 Air Sensors International Conference and the website where the PowerPoint presentations are available (https://asic.aqrc.ucdavis.edu/). Ms. Benedict noted many applications for air quality sensors, as found through a literature review and also listed a few opportunities for their use. She noted that one important question is how to use air sensors during exceptional events, such as wild fires. In terms of advancing sensors, the EPA recently held a workshop to discuss sensor performance targets. Data quality is an issue, as there are questions about the precision and accuracy of the sensors and also about how well the sensors perform in different meteorological conditions and over time. Overall, there is a strong desire for sensor certification, but there is continued discussion about certification protocols and by whom the certification should be performed. Ms. Benedict noted that there are also international sensor initiatives going on in Europe, China, and some low- and middle-income countries where there is an interest in characterizing air quality.

Sensor data management is another issue the EPA is working to address. There are questions regarding privacy, security, ownership, format and storage. Data interpretation and communication is also an issue, and there are currently several different platforms that look similar but are actually displaying different types of data. Ms. Benedict noted that the EPA is also tracking emissions monitoring legislation in California by the California Air Resources Board, South Coast Air Quality Management District, and the Bay Area Air Quality Management District. Ms. Benedict wrapped up her presentation on EPA's perspective on air sensors by indicating that the Agency is planning to publish a policy memo this fall/winter to address recent questions from state and local agencies regarding the use of air sensor data.

Presentation: Outdoor Project Examples

Ms. Gail Robarge (EPA) next presented an overview of the EPA's air sensors research. Ms.

[1] https://asic.aqrc.ucdavis.edu/.

Robarge indicated that there is a vast array of work being done that includes collaboration with several parties. Of high importance is the understanding of sensor performance in laboratory-controlled environments compared with performance in the field. Ms. Robarge highlighted a field evaluation in Denver, in which the performance of seven sensor models were compared with reference sensors. Some key findings from sensor performance testing showed good performance for some sensors on the market, but other have highly variable results. However, the sensors in the field were affected by temperature, humidity and high pollutant concentrations. Ms. Robarge also noted that another sensor study is being conducted to investigate the extent of pollution at the local scale related to one primary source (i.e., a railyard in Kansas City). The EPA and partner agencies also held a contest where the goal was to develop a sensor that could continuously monitor high concentration events in difficult field conditions (i.e., in or near wildfires) and report wirelessly. Ms. Robarge mentioned community air monitoring that has seen traction through the EPA's Science To Achieve Results (STAR) Research Grants. The EPA is next looking to evaluate sensor performance over longer time frames and in diverse locations, and Ms. Robarge emphasized the importance of partnering with local agencies for this effort. The EPA's Air and Energy Strategic Plan will soon be coming out, and it is anticipated that there will be a focus on air measurement methods, support for state and local agencies, and a special focus on wildfire emissions and impacts. Ms. Robarge concluded her presentation by highlighting the many staff involved in the EPA's sensor projects.

Presentation: Overview of Indoor Sensors

Ms. Laura Kolb (EPA) continued the EPA's presentations on air sensors, specifically providing an overview of indoor air quality and sensors. The Office of Air and Radiation's Indoor Environments Division implements non-regulatory programs to improve indoor air quality. According to Ms. Kolb, low cost indoor air quality monitors are widely available, and some people are using these sensors to make decisions about their homes. One of the challenges is that the accuracy of these devices is variable and there is no standard rating system for sensors and monitors. Ms. Kolb noted that there is also concern that the indoor air sensors are not capturing lower particle range emissions. Ms. Kolb explained that indoor conditions are different than outdoor conditions (i.e., temperature, outdoor pollutants migrate indoors, the number and concentration of pollutants may be greater, and indoor chemical reactions can generate particulates and additional chemicals). The use of indoor air sensors is increasing rapidly, but citizens need assistance and guidance from the EPA on how to interpret and use the results appropriately. The goal is have sensors that can provide actionable information.

Lightning Round of Various Perspectives from CAAAC Members

#1 Lightning Round Presentation on Non-Regulatory and Portable Sensors

Mr. Mike Silverstein (Denver Regional Air Quality Council) was the first lightning round speaker to discuss non-regulatory and portable sensors from the Colorado perspective. Mr. Silverstein stated that Colorado has several non-regulatory portable ozone analyzers and PM sensors that are used to characterize air quality across different areas for a number of different reasons. For example, where new industry has moved in, the monitors can provide information

on the air quality in that particular area. Also, there has been an emphasis on wildfires, Mr. Silverstein noted. In his opinion, PM sensors are becoming good in quality, however, low cost sensors for ozone and gaseous pollutants are inadequate, especially at lower concentrations, and need to be further developed. Citizens are concerned about emissions from the oil and gas industry, and it would be nice to have good quality, low cost VOC sensors. Mr. Silverstein added while there are more requests from citizens and local agencies, the state agency is concerned about the quality of the data (e.g., sensor quality, calibration) and how the data might be used (e.g., issue with comparing a one-minute value compared with a 24-hour standard). Lastly, sensors must be set up to output in common units, Mr. Silverstein said.

#2 Lightning Round Presentation on Non-Regulatory and Portable Sensors

Mr. Kris Ray (Confederated Tribes of the Colville Reservation) spoke next on the tribal perspective of air sensors. Mr. Ray provided some background on the Colville Reservation and how they use air sensors. Mr. Ray indicated that air sensors are affordable and a great screening tool, and he noted that the data quality from low cost sensors is improving rapidly. He stated that in many geographical areas, especially tribal areas, there are no monitors at all. In Mr. Ray's opinion, these sensors can help fill gaps and identify problems or provide peace of mind where there is currently no information available.

#3 Lightning Round Presentation on Non-Regulatory and Portable Sensors

Mr. Hunt spoke next on the topic of air quality sensors from the industry's perspective. He indicated that technologies are changing rapidly and have significant potential benefits, but there are some issues to work through. First, it is essential that quality from the sensors is ensured. Second, it is good to have more data, but the data need to be properly understood, especially when the data is taken from an area near a specific facility. Tension can be created when low cost sensors near facilities and are being compared with more sophisticated monitors following established monitoring protocols. Finally, communication must be clear and effective. People need to understand how the sensor results relate to health effects and any limitations of the sensors. In conclusion, Mr. Ray indicated that it is important to balance all these factors and continue the good work that has been made improving low cost sensors.

#4 Lightning Round Presentation on Non-Regulatory and Portable Sensors

Mr. Carbonell spoke next on some of the work EDF has done, with a focus on empowering cities and communities to protect their health. Mr. Carbonell said that EDF has deployed air monitors in communities who are suffering from the effects of air pollution. In one example, they monitored health risks after Hurricane Harvey and found that there were significant pollutants in the air and water as a result of the hurricane. He also noted that EDF partnered with a company to monitor a neighborhood in California that is near a refinery, where it was found that benzene was leaking from storage tanks. Mr. Carbonell further described EDF's work with sensors and stated that the current threats they have found were not detected by anyone else. The technology that is available via air sensors provides a great opportunity to monitor and protect public health; however, traditional regulatory monitors are not located everywhere and can overlook some threats. In summary, EDF is working with communities to

capture this data and apply it in a useful way.

Charge Questions/Feedback from CAAAC Members: Questions #1-#3

Mr. Shoaff indicated that the meeting would now focus on the identified six charge questions that are available in the agenda (see Attachment B). Mr. Shoaff gave an opportunity for those on the phone to make comments and ask questions. Mr. Shelley (via telephone) expressed appreciation for all the speakers who presented today and expressed that the EPA is making good progress. He commented that it is important to value community monitoring, as it is empowering to the citizens of those neighborhoods, and there is value in both the data obtained and in the relationship developed between the agency(s) and the communities.

Mr. Robert Hodanbosi (Ohio EPA) commented that his colleagues who work in water quality have gone through a similar process in dealing with citizen science. For water data, the attitude that citizen data was not "good enough" led to state rules on how data would be accepted and used. Mr. Hodabosi said this provides an example of how agencies have been able to handle citizen-gathered data.

Ms. Peveto commented that there is a tremendous movement to validate sensors. How to reconcile so much data from these sensors, bring it the community level and how to use it are all challenges. In her opinion, there is a lot of air quality data available, and having more of the same types of data is not what is needed, as the existing data does not answer the questions communities have. Communities want to do their own monitoring to ensure they have data for their local area. Ms. Peveto commented that in her area, there is the continued use of older diesel engines, but the EPA has not provided a monitoring protocol for diesel. Ms. Peveto expressed that the EPA could work to address some of the existing issues like this before focusing on new issues, such as sensor data.

Mr. Greenbaum noted that there is a disconnect between the sensors, which measure concentrations every minute, and the health effects that are generally a result of chronic exposures. He suggested that the EPA examine the sensor data and how the data relate to the AQI. He also noted that satellite data has had great improvements, and the data can now be used to assess exposure levels at the 1-kilometer grid level for NOx and PM. He suggested that it could be useful to see how the sensor and satellite data can be combined. Ms. Benedict indicated that the EPA has conducted an analysis of short term (e.g. 1 minute) data points versus longer term averages (e.g. 8 hour or 24 hours) through efforts associated with EPA's Village Green project. She also asked whether there would be a benefit to developing shorter-term sensor messaging and who would be the audience. Mr. Greenbaum replied that he thought the audience would be state and local agencies. Ms. Benedict added that the health science doesn't tell us what a minute of exposure to elevated levels of pollution means for an individual.

Mr. Wyman reiterated the point that many others have made that data quality and data management is important. He emphasized that it is important for the EPA and state and local agencies to develop helpful, informative guidance and to be ready to address communities' concerns and put monitoring results in context.

Mr. Foerter reminded the group that the CAAAC is an advisory committee under FACA. Mr. Foerter said that in the past, the CAAAC has worked hard in between meetings and asked what the CAAAC could do as a group to help the EPA.

In terms of 1-minute readings versus 1-hour measurements, Mr. Marcus stated that this issue has already been dealt with in terms of occupational exposure. He suggested that the occupational expsosure framework could be considered in this air pollution context. Additionally, with respect to public health data, Mr. Marcus suggested that it might be useful for the EPA to use poison center information to relate emission events to reported cases of potentially associated health effects.

Ms. Kruger thanked the EPA for all the presentations and important information. She echoed other comments that there are both opportunities and challenges ahead and that she would compile and submit information from her members. In response to charge question #1, Ms. Kruger remarked that it is difficult to compare sensors due to differences from manufacturer to manufacturer and even sensors within the same manufacturer. She also stated that it there are no standards for the use of sensor data in health studies or how conclusions from this data can be made for policy decisions. She expressed that these are two issues that the EPA should address. She also commented that the short-term 1-hour data sets versus AQI indices designed for longer sets needs to be reconciled. With respect to charge question #2, Ms. Kruger stressed that any data algorithms should not become the replacement for accurate data measurements.

Mr. Ray commented that there is confusion between the Washington state air quality indices and the EPA AQI. He also commented that addressing yearly exposure concerns may be where things are leading, which would incorporate exposure endured from the wood smoke season and from wildfires. As it relates to charge question #2 about data algorithms being used to "correct" raw measurement data, Mr. Ray said that all monitors use algorithms, so the quality of the data and algorithms matters. Ms. Benedict noted that algorithm corrections at the network level are also a concern.

Mr. Flint remarked that sensors measure a specific pollutant at a specific location at one point in time, and how this value is interpreted is critically important. This is a complicated area the public does not understand, and this can end with public mistrust of regulators. He also noted that in his experience, the public does not want to hear that the air quality is fine. Mr. Flint commented that the schedule for the PM and ozone NAAQS does not seem to allow for this type of sensor data to be included in the process.

Ms. Liddington supported comments that sensors only provide a snap-shot, which the public does not understand. She said that the state and local agencies need the EPA's help to communicate the message that acute sensor data should not be compared to chronic health effect benchmarks. She noted that citizens will reach out to the county health departments about their respiratory issues and assert that their condition must be due to emissions from a specific facility close by. Essentially, Ms. Liddington has observed that people have long-term problems that they want to connect to short-term monitors.

Ms. Jennifer Kreusch (Eli Lilly and Company) commented that community concerns have been addressed haphazardly in the past and recommended that the EPA develop guidance and criteria for how these sensors should be used. This way, the EPA can verify that the data is "good" and use it, rather than ignoring the information and the communities' efforts.

Charge Questions/Feedback from CAAAC Members: Questions #4-#6

Ms. Peveto said that there is guidance missing on how to evaluate indoor air quality for institutions like schools and urged the EPA to provide direction.

Mr. Wyman noted that indoor biological contaminants can have a big impact on public health, especially on asthma. He expressed that he would like to have a comparable amount of data on biological contaminants and not only chemical pollutants, as the control of biologics can be life-changing. Mr. Hodanbosi commented that it is much more difficult to monitor biologics compared with chemicals. Mr. Greenbaum asked whether there is a market or incentive structure for biologic sensors and whether the sensors are the same for measuring VOC indoors and outdoors.

Ms. Hayes stated that indoor air quality guidance is needed. She noted that there is some guidance, but most of it is very general or is old and needs to be updated. Ms. Hayes highlighted an issue with modern building codes and the conflict between buildings being sealed off for efficiency reasons but are violating ventilation standards. This issue is known, but an indoor dataset would be helpful to shed light on and address this issue, Ms. Hayes added.

Ms. Liddington added that there are many issues with asthma and mold, but there is reluctance from landlords and building owners to change their buildings to address potential issues, like proper ventilation. Ms. Liddington expressed that maybe indoor air sensors could provide a body of evidence that could help demonstrate that these issues should be addressed.

Mr. Marcus remarked that in terms of indoor air sensors and children, it is important to remember that children are shorter than adults. He noted that monitors placed at an elevated position can have very different readings from what children are exposed to.

Ms. Benedict thanked everyone for the feedback on this topic and looked forward to the next time the group meets to discuss air sensors. Mr. Shoaff indicated that there will be a follow-up discussion at the next CAAAC meeting on this topic.

Next Steps and Closing

Mr. Shoaff highlighted a few items related to CAAAC including the Clean Air Excellence Awards. He said that the EPA will be having the awards ceremony again and they will be asking for panelists and nominations soon. He also noted that there have been some updates to the awards criteria and asked the CAAAC members to help get the word out for potential nominations.

Mr. Shoaff indicated that the next CAAAC meeting will be held sometime in the spring. He

also mentioned that there are some CAAAC members who are rotating off the committee, and he expressed gratitude for their participation. Mr. Shoaff thanked the group for all their input, time, and comments. Mr. Shoaff adjourned the meeting.

Attachment A

Clean Air Advisory Committee (CAAAC)

September 26-27, 2018

Attendance Sheet

First Name	Last Name	Affiliation
Committee Members		
Rhonda	Anderson	Sierra Club
Roxanne	Brown	United Steelworkers
Michael	Buser	USDA, Agricultural Research Service
Tomás	Carbonell	Environmental Defense Fund
Susan	Collett	Toyota Technical Center
Natalene	Cummings	Forest County Potawatomi Community, Natural Resources Department
Steven	Flint	NY Department of Environmental Conservation
David	Foerter	Ozone Transport Commission
Daniel	Greenbaum	Health Effects Institute
Sara	Hayes	American Council for an Energy-Efficient Economy
Mitchell	Hescox	Evangelical Environmental Network
Robert	Hodanbosi	Ohio EPA
Adrienne	Hollis	We Act for Environmental Justice
Tim	Hunt	American Forest and Paper Association & American Wood Council
Gary	Jones	Specialty Graphic Imaging Association
Jennifer	Kreusch	Eli Lilly and Company
Nancy	Kruger	National Association of Clean Air Agencies
Melanie	Lawson	Choctaw Nation of Oklahoma
Lynne	Liddington	Knox County Health Department
Steven	Marcus	Rutgers University
Robert	Morehouse	Air Permitting Forum
Brian	Mormino	Cummins, Inc.
Dan	Nickey	Iowa Waste Reduction Center
Peter	Pagano	Environment and Energy, Boeing
Mary	Peveto	Neighbors for Clean Air
Frank	Prager	Xcel Energy Inc.
Kris	Ray	Confederated Tribes of the Colville Reservation
Michael	Rochford	Caterpillar, Inc.
Kimberly	Scarborough	Public Service Electric & Gas
Adrian	Shelley	Air Alliance Houston
John	Shoaff	U.S. Environmental Protection Agency
Michael	Silverstein	Colorado Department of Public Health and Environment
Ted	Steichen	American Petroleum Institute

Clean Air Advisory Committee (CAAAC)

September 26-27, 2018

Attendance Sheet

First Name	Last Name	Affiliation
Patricia	Strabbing	Chrysler Group, LLC
Mary	Uhl	Western States Air Resources Council
Larry	Weinstock	U.S. Environmental Protection Agency
Robert (Bob)	Wyman	National Climate Coalition
Presenters and Attendees		
Kristen	Benedict	U.S. Environmental Protection Agency
Laureen	Burton	U.S. Environmental Protection Agency
Bill	Charmley	U.S. Environmental Protection Agency
Kevin	Culligan	U.S. Environmental Protection Agency
Robyn	DeYoung	U.S. Environmental Protection Agency
Phil	Dickerson	U.S. Environmental Protection Agency
Matthew	Goodwin	AJW, Inc.
Kathleen	Horchler	Caterpillar
John	Kirsman	Edison Electric Institute
Laura	Kolb	U.S. Environmental Protection Agency
Denise	Mulholland	U.S. Environmental Protection Agency
Tanya	Parise	SC&A Inc.
Stuart	Parker	IWP News
Sean	Reilly	E+E News
Leslie	Ritts	NEDA/CAP
Gail	Robarge	U.S. Environmental Protection Agency
Julie	Rosenberg	U.S. Environmental Protection Agency
Amena	Saiyid	Bloomberg Environment
Carolyn	Slaughter	APPA
Lesley	Stobert	SC&A Inc.
Bill	Wehrum	U.S. Environmental Protection Agency

Attachment B

Clean Air Advisory Committee (CAAAC)

September 26-27, 2018

Agenda

Wednesday, September 26, 2018 – Arlington Room (Ballroom, Lobby Level)

12:30 PM	Registration Begins
1:00 – 1:15	**Opening Session** Welcome by Chair/Other, Introductions, DFO opening statement
1:15 – 2:00	**AirNow Update** *Phil Dickerson* Phil Dickerson, who leads the AirNow Program at US EPA, will present the history of AirNow's efforts to provide the public with real time information they can use to reduce or avoid exposure to poor air quality. He will talk about how the program developed from a regional initiative to a national, and even international, system used across the US as well as in Mexico and China. After covering how the program came about, Phil will demonstrate the new airnow.gov website, which was recently rebuilt from the ground up. He will cover how the new design was developed and show how the new site improves public access to air quality information.
2:00 – 2:45	**Tools for State and Local Government** *Denise Mulholland, Robyn DeYoung and Julie Rosenberg* Energy Efficiency and Renewable Energy Tools for State and Local Governments Presentation on some of the tools and resources that EPA has developed that the states and localities use to achieve their air quality goals.
2:45 – 3:30	**Overview of new SAFE standard** *Bill Charmley* On August 2, the U.S. Environmental Protection Agency and U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) released a notice of proposed rulemaking, the *Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks (SAFE Vehicles Rule)*. This session will present an overview of the proposed rule.
3:30 – 3:45	Break
3:45 – 4:30	**Overview of new Affordable Clean Energy (ACE) proposal** *Kevin Culligan* Presentation on recent proposal and questions and answers.
4:30 – 5:00	**OAR Overview & Update on Priorities** *OAR Assistant Admin. Bill Wehrum + CAAAC Members' Q & A*
5:00 – 5:30	**Public Comments**
5:30 PM	**Meeting Adjourned**
6:15 PM	**Group Dinner at Rustico Restaurant & Bar | 4075 Wilson Blvd.**

Thursday, September 27, 2018 – Arlington Room (Ballroom, Lobby Level)

8:30 AM – 8:45	**Welcome to Day 2**

8:45 – 11:45 Break at 10 AM	**Sensors Discussion (See detailed agenda on back.)** *Kristen Benedict et al.* This session will be divided into two parts. In the first half of the session, EPA will provide an overview on the use of air quality sensors in the outdoor and indoor environment including discussion of ongoing projects and initiatives. Select CAAAC representatives will then participate in lightning round presentations offering 5-minute perspectives on sensors. The second half of the session is dedicated to receiving feedback from CAAAC members on the morning presentations and charge questions provided in advance.
11:45 – 12	**Public Comments**
12 Noon	Meeting adjourned.

Detailed Agenda

Thursday, September 26, 2018 – Arlington Room (Ballroom, Lobby Level)

8:30 AM – 8:45	**Welcome to Day 2**
8:45 – 8:50	**Introduction to Session** *Kristen Benedict, EPA - OAQPS*
8:50 – 9:15	**Sensors Overview** *Kristen Benedict, EPA - OAQPS*
9:15 – 9:25	**Outdoor Project Examples** *Gail Robarge, EPA - ORD*
9:25 – 9:35	**Overview of Indoor Sensors** *Laura Kolb, EPA - ORIA*
9:35 – 10:00 Note: Each speaker presents 5 minutes or less	**Lightning Round of Various Perspectives from CAAAC Members** *Speaker #1 – Mike Silverstein* *Speaker #2 – Kris Ray* *Speaker #3 – Tim Hunt* *Speaker #4 – Tomas Carbonell* *Speaker #5 – Gillian Mittelstaedt*
10:00 – 10:15	Break
10:15 – 11:30	**Charge Questions/Feedback from CAAAC Members** **Charge #1 –** Please provide feedback on the key areas of focus for air sensors – data quality, data interpretation, and data management. Are any key focus areas missing? Specifically, please describe considerations for interpretation of real-time data (e.g. 1 minute) in the outdoor and/or indoor environment. Also, how can EPA effectively manage or access data from various projects both within and outside the Agency? **Charge #2 –** What should EPA consider when data algorithms are being used to "correct" raw measurement data? **Charge #3 –** [Outdoor air specific] How are the considerations for use of sensors in ambient and source environments different? What about near source environments? **Charge #4 –** [Indoor Air Specific] For sensors that have been tested or evaluated for outdoor use, please comment on what additional research should be done to assess those sensors for indoor use. Are there additional considerations for long term use? **Charge # 5 –** [Indoor Air Specific] Please provide feedback on how sensors for detection of multiple indoor pollutants and/or complex mixtures found in indoor environments should be evaluated. **Charge #6 –** [Indoor Air Specific] Please comment on the state of sensors for biological contaminants

	indoors, particularly for use in residential environments, and what further research may be required to further develop or evaluate them.
11:30 – 11:45	**Next Steps**
11:45 – 12	**Public Comments**
12 Noon	Meeting adjourned.