



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
OFFICE OF AIR AND RADIATION

October 2, 2005

MEMORANDUM

SUBJECT: Office of Air and Radiation Response to Science Advisory Board (SAB)  
Review Comments on *Concept Plan for Ambient Air Monitoring After  
Hurricane Katrina* (September 13, 2005)

FROM: Elizabeth Craig */Signed/*  
Deputy Assistant Administrator for Air and Radiation

TO: Fred Butterfield  
Designated Federal Officer

The Environmental Protection Agency (EPA) Office of Air and Radiation would like to thank you for coordinating the Public Conference call of the SAB Workgroup on Air Monitoring Plan on September 14, 2005, and working with the workgroup chair Dr. Armistead (Ted) Russell to provide us the minutes of the meeting. We would also like to thank the SAB for providing comments and suggestions to the Concept Plan. We have taken the SAB comments and suggestions into consideration in planning for ambient air monitoring in this complex situation. Since the call, we have also learned considerably more about the situation in the field and been able to coordinate more completely with the Incident Management Team. Attached is the revised version of our plan, now titled *Overview Plan for Ambient Air Monitoring After Hurricane Katrina*, reflecting the comments from the workgroup and this more recent information.

Attachment

cc: Bill Wehrum, OAR  
Tim Oppelt, ORD  
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Regional Administrators, EPA Regions 4 and 6  
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**EPA's Response to the Science Advisory Board (SAB)  
Workgroup on Air Monitoring Plan  
Comments  
on the  
Concept Plan for Ambient Air Monitoring After Hurricane Katrina**

**On August 28, 2005, Hurricane Katrina made a second landfall on the southern U.S. coast, causing massive damage and flooding to broad areas of Alabama, Louisiana and Mississippi. The EPA prepared a preliminary plan for ambient air monitoring in the affected areas. A public teleconference meeting was held with an SAB workgroup on September 14<sup>th</sup>, 3:10 – 6:00 pm EST. This was a “consultation” to provide EPA rapid advice on scientific and technical issues from Hurricane Katrina. Dr. Armistead (Ted) Russell, chair for the SAB workgroup that reviewed the concept plan and Fred Butterfield, Designated Federal Officer compiled a “Summary Minutes” of this Teleconference. These minutes and individual comments by 14 of the Workgroup members can be found at [http://www.epa.gov/sab/05minutes/katrina\\_air\\_monitoring\\_plan\\_wg\\_09-14-05\\_final\\_minutes.pdf](http://www.epa.gov/sab/05minutes/katrina_air_monitoring_plan_wg_09-14-05_final_minutes.pdf)**

**CHARGE QUESTION 1**

**“The plan identifies several situations as needing to be addressed by the post-storm monitoring program:**

- Flooded Areas**
- Areas Damaged by Flood or Winds – Other Considerations**
- Open Burning of Biomass, Building Debris, and Other Debris**

**Are these the situations that should most receive monitoring attention?”**

*Comment from SAB Workgroup*

Discussion began with the suggestion that emissions from transport or solid waste needs to be addressed. Lake Pontchartrain might be a sustained source of volatiles. Siting issues are important and the burning scenarios have not yet been finalized. Debris disposal options need to be innovative.

*Response*

The revised plan more explicitly addresses waste handling as an emissions source. In addition, EPA guidance on waste handling in the affected areas emphasizes control of dust. Water monitoring in Lake Pontchartrain is beyond the scope of the air monitoring plan, but has been addressed separately. The revised plan provides for a fairly dense network of population-oriented monitoring sites in New Orleans, so that the near and more distant impacts of burning anywhere in the city can be assessed. Debris disposal is

addressed by two state-written debris plans, which are referenced in the revised monitoring plan.

*Comment from SAB Workgroup*

At the World Trade Center, ground-based monitoring of plumes was found to be difficult and a tethered balloon would be useful. Additionally, PM 10 data was valuable early on, and posting that data on a Web site one or two times a day would be useful for New Orleans as well.

*Response*

Another comment during the consultation discouraged “plume chasing,” and, accordingly, the initial monitoring sites will be population oriented. Options regarding plume transport path prediction are still being explored through discussions with several Federal offices with related experience and capability. EPA does intend to provide frequent updates of data on a public Website, including near-real time hourly PM2.5 and/or PM10 mass concentration data from several monitors in New Orleans and coastal Mississippi. See <http://www.epa.gov/katrina/testresults/air/index.html>

**CHARGE QUESTION 2**

**“Are the pollutants that are the targets of the monitoring aimed at these situations appropriate?”**

*Comment from SAB Workgroup*

Continuous real time monitoring of PM10 and PM2.5 is important as the first line of monitoring, followed by grab samples of smoke at industrial sites. The latter could be analyzed quickly to determine what’s actually there. The original dust and smoke samples from the World Trade Center site were useful for determining what to monitor there. Chloromethane, acrolein, PAHs, dioxins, and furans would be more important than VOCs. Ozone and NOX are not too important.

*Response*

Real time monitoring of PM10 and PM2.5 is part of the plan and has already begun. See <http://www.epa.gov/air/katrina/pm25-hourly.html>. Chloromethane, acrolein, and PAHs will be monitored, as part of a comprehensive suite of toxic gases and semivolatile VOCs. EPA is still considering possible monitoring goals and approaches for dioxins and furans. The revised plan also lists some other substances and properties still being considered. So far, testing of sediments (<http://www.epa.gov/katrina/testresults/sediments/#2>) has not found any material of concern that is not presently planned for analysis.

*Comment from SAB Workgroup*

Initial establishment of general station areas stations throughout New Orleans for asbestos, metals, oil spills, benzene, toluene, and xylene would be useful. Then, assess the results and determine what specific compounds should be monitored over time, until monitoring can be phased-out. A similar approach could be employed for burn sites. Burn monitoring and restoration of ambient air monitors should be separated and clearly identified as two tracks in the Draft Plan.

*Response*

The revised plan takes the suggested approach, providing for a network of stations monitoring a wide range of pollutants including those mentioned (except "oil spills"). The data from this monitoring will be assessed, along with information on whether burning activity has stabilized, to determine which should continue to be collected and analyzed.

The revised plan clearly separates out restoration of pre-storm ambient monitoring as a lower priority except where the type of monitor is relevant to the goals of the plan.

*Comment from SAB Workgroup*

A suggestion was made that water quality and sediment data could be a useful guide for ambient air. However, burning will result in the formation of additional chemicals that would not be found in early water and sediment samples. Dust samples from surfaces once they dry would also prove useful. SO<sub>2</sub> also has the potential to be a contributor to the mix of ambient pollutants. Major sources include refineries and coking emissions, and emissions could also occur from burning. Aethelometers would be useful for obtaining real time data, particularly using the 315 nm extra wavelength.

*Response*

We have reviewed the available water and sediment sampling data, which suggests that our large initial suite of pollutants – picked for logistical considerations and with knowledge that open burning is also a source of interest -- is sufficient. We will monitor dust that is re-suspended, rather than on surfaces. The population-oriented monitors will be able to observe emissions from whatever sources are impacting the New Orleans area.

We have not at this time planned to employ aethelometers, but may revisit that once the more conventional monitoring stations are deployed and give some indication of the air quality situation.

*Comment from SAB Workgroup*

Radiological materials from hospitals may have been released due to flooding and building damage and should be considered. Biologicals are important and are not

addressed in the current draft plan. As time goes on, the biologicals (e.g., endotoxins, pathogens) will be a more important issue as things dry out and volatilize.

*Response*

Radiological materials from hospitals, if released, would have very short half lives. To date, monitoring from aircraft reportedly has not shown a problem. CDC/ATSDR is working closely with EPA, and so far has advised that ambient air monitoring for biological pathogens related to flood waters is not necessary. This is discussed at more length on pages 5 and 6 of the revised plan.

*Comment from SAB Workgroup*

Asbestos facilities must have management plans. Asbestos containing buildings should be identified and treated differently than non-asbestos containing buildings

*Response*

EPA agrees, and has and will issue appropriate advisories and policies on asbestos demolition and debris disposal.

**CHARGE QUESTION 3**

**“To the extent that EPA has been able to describe or reference the monitoring methods, equipment, and quality assurance activities in the document, is this appropriate? What advice do you have for EPA as we further develop the methods and equipment plans?”**

*Comment from SAB Workgroup*

PM10 is primary, with emphasis on real-time and fast response as the priority. Once objectives stabilize, recheck monitoring. Fast gas chromatography (GC) methods, like those developed by Ed Overton of LSU, should be included as a candidate instrument for the sampling plan to allow monitoring of multiple organics in minutes in real time.

*Response*

The revised plan gives more attention to PM10, providing for simultaneous measurement of PM2.5 and PM10 in most situations. The plan also calls for reassessment of the situation during the first 90 days. Non-standard methods such as fast gas chromatography are not presently part of the plan, but will be reconsidered as more is known and immediate tasks of establishing the first sites using more conventional methods are complete. Section IV.E discusses this at more length.

*Comment from SAB Workgroup*

Widespread burning might cause direct exposures to a number of compounds such as dioxins and furans. H<sub>2</sub>S emissions may also increase, particularly as things start to dry out. Additionally, deposited material on streets from burning and dry dust re-suspension may be a problem.

*Response*

EPA recognizes these possibilities and has considered them.

*Comment from SAB Workgroup*

Lake Pontchartrain may also be a source of volatiles. PM and VOCs could be monitored at the surface by mobile monitoring equipment.

*Response*

The revised plan makes it clearer that the objective of monitoring is to provide information for choices among possible governmental and private actions to reduce emissions or exposure. While the lake may be an emissions source, those emissions would not be controllable.

**CHARGE QUESTION 4**

**“Are the pre-storm state-operated sites and the proposed samplers for each (as listed in the footnote on page 4 of the draft plan) likely to be relevant to monitoring the air quality aftermath of the storm itself and of the recovery efforts, if they can begin operation about three or four weeks? Should this restoration be lower or higher priority than establishing the burning-oriented monitoring sites?”**

*Comment from SAB Workgroup*

Pre-storm monitoring sites were developed for other conditions, most were population exposure cited, and should have a lower priority. The initial focus should be on issues of the storm’s aftermath, followed by siting the fixed monitors as New Orleans is re-developed.

*Response*

EPA agrees. For now, logistics such as power and security are very important in selecting monitoring sites. Long term changes to the local monitoring network will be considered by the state as part of its annual monitoring review.

**“What advice do you have for siting the three fixed air toxics sites so that they will succeed in characterizing the constituents of the smoke from the burning facilities and their relative concentrations? How far downwind should they be?”**

*Comment from SAB Workgroup*

Burning is always very challenging. The critical design element for monitoring is near-field exposure. Locating burning sites in or away from cities is always a concern. Some information might be gleaned from sugar cane burning in Louisiana, which often results in a broad cloud of smoke under the inversion rather than a plume. Existing satellite data may provide some understanding of plume behavior under Louisiana climactic conditions for part of the year. One member asked whether satellite data with greater resolving power than that commercially-available be accessed. Regarding how far downwind, the sites should be equally spaced on a log scale to get insight for linear and non-linear transport. Minimums and maximums have to be determined after the sites are established.

*Response*

On the basis of other comment from the workgroup members, the revised plan does not “chase plumes” but instead focuses on population receptors. We have been advised that satellites generally will not be successful at identifying open burning sites.

**“The plan proposes that the portable PM<sub>2.5</sub> monitors be placed in the predicted plume path each day, at a variety of downwind distances. What range of distances should be used? Is the concept of using PM<sub>2.5</sub> concentrations from one of these portable monitors (which is intended to be in the center of the plume each day) along with the PM<sub>2.5</sub> measurements at the associated fixed air toxics site (which may be off the center line of the plume some days or even outside the plume entirely) and meteorology data to estimate air toxics concentrations at the location of the portable PM<sub>2.5</sub> monitor workable? Is the PM<sub>2.5</sub> concentration alone likely to be valuable information, if no meaningful estimates of specific air toxics can be made using this scheme?”**

*Comment from SAB Workgroup*

Land sea-breeze meteorology might effect local situations and should be examined in the context of canisters. PM<sub>10</sub> and PM<sub>2.5</sub> monitors go hand-in-hand. It would be best to collocate them.

*Response*

The charge question is largely irrelevant given the advice to focus on population receptors. PM<sub>10</sub> and PM<sub>2.5</sub> will be collocated. We are still exploring possible approaches to daily plume prediction.

**CHARGE QUESTION 5**

**“The HYSPLIT4 (HYbrid Single-Particle Lagrangian Integrated Trajectory model) tool provided by NOAA has the advantage of being well known and accessible. Is it suitable for providing estimates of the likely path of the ground-level impact of the**

**plume from burning facilities of interest? How far downwind (in terms of miles or hours of transport) should trajectories be displayed for? Is there another approach that should be considered as a way to meet the objective of giving state/local agencies information on likely plume path so that they may inform the public if they choose?"**

*Comment from SAB Workgroup*

Mesoscale models may be more fruitful for forecasting than what is proposed, along with using satellite data.

The Lawrence Livermore Laboratory has different models to predict plumes. The Agency might check to see if they would be available to assist EPA. There is also a group at Texas A&M University conducting daily prognostic modeling that already includes New Orleans. The grid is almost where you want to be. EPA might contact them for assistance as well.

*Response*

We are still exploring possible approaches to daily plume prediction, including those mentioned by workgroup members. HYSPLIT is no longer presumed to be the preferred approach.

## **OTHER WORKGROUP MEMBER COMMENTS, QUESTIONS, AND ISSUES**

*Comment from SAB Workgroup*

It is easier to monitor mercury gases than mercury particulates and not that difficult to do. Should the Agency monitor gaseous mercury?

*Response*

EPA realizes that mercury is likely to be mostly present in the gas forms, but logistically it is easier and fastest to initially sample for particle phase mercury. If mercury is found, the monitoring approach will be reconsidered.

*Comment from SAB Workgroup*

The Agency should triage the problem and be guided by water, sediment, and dust samples to decide.

*Response*

Staff preparing the monitoring plan has been reviewing the results of the water and sediment testing posted at <http://www.epa.gov/katrina/testresults/sediments/index.html> and <http://www.epa.gov/katrina/testresults/water/index.html>.

*Comment from SAB Workgroup*

Debris collection and burning should be separated into classes to limit toxic-waste burning. There will probably be trees, debris, white debris, and hazardous wastes. The latter should go only to permitted hazardous waste landfills to the extent that they can be identified.

*Response*

Debris management is outside the scope of the ambient air monitoring plan; however, OAR has reviewed the current debris/demolition plans to inform air monitoring efforts. EPA agrees with the SAB advice to separate debris and has issued advisories and policies consistent with this advice.

*Comment from SAB Workgroup*

The SAB workgroup recommends publicizing and picking up hazardous household wastes because people will not have transportation.

*Response*

Waste management is outside the scope of the ambient air monitoring plan, but EPA agrees.

*Comment from SAB Workgroup*

EPA needs a much better statement of the objectives for this Draft Plan. Focus the objectives on immediate needs. After people begin to get their lives back in shape, develop short-term, mid-term, and long-term goals.

*Response*

EPA considers this advice very fundamental, and has restructured the plan to make the primary goal of monitoring – guiding actions – more clear. We have also clearly identified phases of the monitoring program.

*Comment from SAB Workgroup*

Portable generators and battery operated monitors will be needed initially due to the absence of power.

*Response*

Battery operated monitors are a major element of the plan.

*Comment from SAB Workgroup*

The National Institute for Occupational Safety and Health (NIOSH) should be involved in training emergency workers.

*Response*

Training for emergency workers is outside the scope of the ambient air monitoring plan.

*Comment from SAB Workgroup*

The Agency should coordinate biological monitoring for endotoxins with other monitoring activities. Biologicals can be collected with ambient air monitors. The U.S. Centers for Disease Control and Prevention (CDC) will typically focus on water pathogens, not endotoxins and other biological that might be present.

*Response*

See previous comment about advice from CDC/ATSDR.

*Comment from SAB Workgroup*

EPA should strongly consider ambient air monitoring in Baton Rouge, LA. The influx of people and automobiles has been dramatic and may provide a unique learning opportunity.

*Response*

The normal state-operated monitoring network in Baton Rouge was not affected by the storm, and EPA believes it meets current needs even in light of additional population and traffic.