# U.S. Environmental Protection Agency
# Science Advisory Board

## Final Minutes of Public Meeting September 13, 2005

**Committee:** SAB Workgroup on Residue Sampling Plan. (See attached Roster)

**Date and Time:** September 13 from 1-4 Eastern Time (See attached Federal Register Notice )

**Location:** By telephone only, run from cubicle 3610E, 1025 F Street Northwest, Washington D.C.

**Purpose:** The purpose of this meeting was to allow the SAB readers to discuss the Agency's *Emergency Response Quality Assurance Sampling Plan for Hurricane Katrina Response Screening Level Sampling for Sediment In Areas Where Flood Water Receded, Southeast, Louisiana*, prepared by U.S. Environmental Protection Agency Region 6, including Appendices A, B, and C. (These materials are posted at the SAB's website, www.epa.gov/sab and will be found in the FACA file for this meeting)

**Materials Available**: The following materials were distributed before the meeting:

1. agenda
2. roster and biosketches
3. *Emergency Response Quality Assurance Sampling Plan for Hurricane Katrina Response Screening Level Sampling for Sediment In Areas Where Flood Water Receded, Southeast, Louisiana*, prepared by U.S. Environmental Protection Agency Region 6, including Appendices A, B, and C
4. Collected individual comments from ten readers, available by 4 p.m. September 12
5. Additional comments from Sam Luoma and Joan Rose provided in the evening of September 12.
6. Further comments from John Maney and Louis Thibodeaux provided in the morning of September 13.

**Attendees:** Because this was a conference call, there are no sign-in sheets.

The following individuals from the Workgroup were present for most or all of the call:
David Dzombak, chair
Richard Gilbert
Jeffrey Griffiths
Samuel Luoma
John Maney
Douglas Splitstone
Louis Thibodeaux
James Watson

The following individuals from the SAB Staff Office were present for part or all of the call:
Anthony Maciorowski, Associate Director for Science
Thomas Armitage, DFO
Holly Stallworth, DFO
Kathleen White, DFO

The following individuals from EPA were present for part or all of the call:

From Region 6
1. Tami Engle
2. Randy Sturgeon
3. Mike Callahan
4. Carl Edlund
5. Jeff Yurk,
6. Cynthia Kalleri
7. Dick Watkins
8. Greg Lyssy
9. Walt Helmick
10. Nick Stone
11. Nancy Fagan
12. Bruce Jones
13. Paul Sieminski

From Cincinnatti
1. Deborah McKean
2. Fran Kremer
3. Bob Olexsey

From Headquarters
1. Mary Manibusan, ORD
2. John Schaum, ORD
3. Mike Broder, NCEA
4. Gary Bangs NCEA
5. Barry Lesnik OSW
6. Kim Kirkland OSW (joined later)
7. Charles Sellers OSW (joined later)

The following individuals were present from the State of Louisiana
1. James Brent
2. Keith Casanova
3. Steve Chustz
4. Tom Harris

The following individuals from the press were present
1. Mark Schleifstein, The Times-Picayune
2. Cheryl Hogue, Chemical and Engineering News
3. Anthony Lacey, Inside EPA

There were other individuals who had requested the conference call number, indicating that they planned to attend. The total number of people who participated in the call was approximately 45.

**Summary**

The meeting went largely according to the agenda (attached)

The Workgroup commends EPA Region 6 for developing the Sediment/Residue Sampling Plan in such a short time and under such difficult circumstances. Further, Region 6 is to be commended for seeking scientific advice early in the sampling period when the benefits of outside advice are the greatest. Overall, the plan is appropriate for a rapid, preliminary assessment of the kinds of contaminants present in sediment/residue deposited by receding floodwaters in the New Orleans area. The Workgroup supports the approach to select sampling locations based on judgment as to locations most likely to be highly contaminated. However, the Workgroup recommends that consideration be given to introducing a probabilistic component to the sampling plan, and to revising the sampling plan to encompass more of the impacted area. This will not necessarily involve collection of more samples than originally planned, and would make the data obtained more useful for estimating extent of contamination and other purposes. Further, the SAB recommends that microbiological contaminant analysis beyond fecal coliform be implemented. Since sewage contamination is already known to be present in most of the affected areas, analysis of individual pathogens should be conducted to obtain more specific information about the nature of the microbiological contamination. The Workgroup is persuaded that the list of chemicals to be analyzed is comprehensive. The Workgroup suggests that this list could even be reduced if necessary to support sampling of pathogens, which pose greater short-term risks than some of the chemical analytes listed which are of greater concern for long-term exposure and risk. Key issues identified in the meeting are summarized in more detail in Section 4 of these minutes. The Workgroup thanks Region 6 for the opportunity to provide some assistance, however modest, to the Hurricane Katrina recovery effort.

The following is a chronological summary of the meeting.

**1. Welcome, Roll Call, and Opening Remarks DFO Kathleen White** (1:03)

Kathleen White, the Designated Federal Officer welcomed those present. She explained that the Science Advisory Board, which operates under the Federal Advisory Committee Act, is a group of engineers and scientists from outside of EPA who advise the Administrator on selected science issues. The Board's meetings are announced in the Federal Register and they are open to the public. The process normally proceeds at a rather stately pace and those of you who have

worked with the Board in the past may be wondering how the SAB could be asked to review something on Thursday morning and be holding a public meeting on Tuesday afternoon.

The answer is that a provision of FACA (under section 102.3.150 (5) (b)), says that, "In exceptional circumstances, the agency . . . may give less than 15 calendar days notice, provided that the reasons for doing so are included in the advisory committee meeting notice published in the Federal Register." The present circumstances are exceptional and such a notice was forwarded for publication last Friday. This call allows the Agency and the public to observe the Workgroup as it deliberates on the materials provided by the Agency.

All the members of the SAB Workgroup on Residue Sampling Plan serve, or have served, on other SAB Panels and subcommittees. The have filed confidential financial disclosure forms, taken an ethics training course designed specifically for people serving on SAB advisory bodies, and have provided updated information regarding this activity. All of this has been reviewed by the office's ethics and FACA policy officer.

Materials relating to this activity are posted on the SAB's website (www.epa.gov/sab). These include the roster, biosketches, the charge and documents provided by EPA, the agenda, and the preliminary individual responses prepared by work group members in advance of this conference call. Other materials will be posted there as they become available, including the minutes of this call. The minutes will be used to document the findings and recommendations of the Workgroup.

One of the major goals of this call is to ask the Workgroup, using their expertise and the collected individual comments, to discuss the plan in light of the charge questions and provide consultative advice that is as unambiguous as possible. The Agency has crews in the field, under very difficult circumstances, and the public is highly interested in receiving credible scientific information in the most expeditious manner possible.

**2. Discussion of Sampling Plan and Charge Questions** (1:15)

The chair, David Dzombak, began with an opening statement, given below.

> "EPA Region 6 is to be commended for moving quickly to protect human health in relation to the sediments deposited by the flood waters in the New Orleans area and elsewhere in the Gulf region, and for their efforts to try to think about the full range of issues related to sampling the sediments in the unusual setting of urban, residential areas.
>
> The Science Advisory Board is pleased to have the opportunity to be of service to Region 6 and the nation in this very stressful time for our country.
>
> I would like to thank the SAB members who are serving on this committee for their very rapid response in reviewing the plan that was completed late Friday, September 9, and for clearing their schedule and making other extraordinary efforts to participate in this phone conference today.

All members of the committee have submitted written comments on the Sampling Plan, including many detailed comments on specific parts of the plan, and these individual comments will be part of the record of this effort to pull together collective scientific advice from a multi-disciplinary group of SAB members.

The purpose of today's call will be to go through each of the charge questions given to the committee, and have discussion of each of those charge questions. The aim in the discussion will be to identify key points on which there is agreement among most of the committee members. It will not be our intent, and we do not have time to conduct a review of all of the individual comments received. After going through the charge questions, I will attempt to summarize the most important points related to the charge questions, and will invite subsequent comments from the committee on my summary. At the end of the three hours, my objective is to leave the folks from Region 6 with a clear understanding of what this group of experts believes are the central issues to be reconsidered with respect to the sediment sampling plan. I am sure that all of the individual comments will be read with interest by the team that is planning and conducting the sediment sampling. This phone conference is an opportunity to bring forth from the collected comments the most important issues.

We have 6 charge questions to discuss. I will limit discussion on each charge question to 15 minutes. This means that I may need to cut off some folks if I believe that a point has been made sufficiently, and I may need to terminate discussion of a particular charge question rather abruptly. Please forgive me in advance. Also, please be mindful of the time limits under which we are operating when making your points. At the conclusion of the discussion of the charge questions, we will have 10 minutes for any other comments that members of the committee may wish to make. We will then allow a brief period of time for public comments, if any members of the public present wish to make comments.

In the last part of our phone conference, about 40 minutes or so, I will summarize key issues raised in regard to each charge question, the committee will discuss these key issues, and we will provide an opportunity for response and comment from the EPA folks of Region 6 and elsewhere who are directly involved with the sampling efforts."

## A. Discussion by Charge Question

### *1. Are the project objectives and the preliminary nature of this plan clearly stated ?* (1:20)

Dick Gilbert noted the objectives were stated differently in different parts of the plan. The objectives to identify whether contamination is present and the types of contamination are clear. Elsewhere it appears there are health questions and it is not clear that the limited scope of the current sampling plan can address the larger questions of exposure and risk.

James Watson thought that the objectives could be interpreted as broader than can be supported by this initial screening assessment. The limitations of the initial screening assessment could be made more clear.

Jeff Griffiths echoed Watson's comments.

Sam Luoma thought this could be solved if we could determine EPA's objective in terms of area to be sampled. If the focus is on human health, as appears to be the case and as is appropriate, this should be stated explicitly. What is EPA's geographic goal? Should the Workgroup ask EPA what it is, or suggest one for them? If their goal is to be very precise about one segment, that is one thing, characterizing a larger area is another.

Dave Dzombak asked Region 6 to clarify the intended geographical extent of the sampling. Carl Edlund responded that the initial screen was limited to selected neighborhoods of New Orleans where the flood waters have receded leaving residues in the urban area.

Doug Splitstone said that was his original understanding, but as he read further, it seemed to get fuzzier.

Dave Dzombak said that the objectives on the first page are clearly stated, but subsequent statements of objectives are expanded in scope and extent. The Workgroup might recommend that the later statements of objectives be synchronized with the initial statements.

Watson disagrees. He believes that the objectives stated in section 1.1 seems to be broader than the actual plan. The objective as stated could be interpreted to apply beyond the sample area.

Randy Sturgeon of Region 6 said that the intent was that the samples would be used to screen the area where they were collected.

James Watson recommended they just make that clear.

Region 6 said this was helpful.

Sam Luoma asked what the Workgroup should assume about the objective of the sampling plan as the discussion goes forward – is it multiple one square mile areas?

Dave Dzombak said, if you look at the statements on page 1 of the sampling plan, we have clarification that the geographical focus is selected areas of New Orleans where the flood waters have receded. There are suggestions from the Workgroup that it should be clarified and that EPA's focus is on human health.

John Maney said there is a disconnect between the objectives as stated and the data uses described further into the document. For example, one data use is to decide whether there will be further assessment of a particular sediment in a particular area.

***2. Please comment on the validity of the sampling approach and the adequacy of the methods to accomplish the project objectives.*** (1:33)

Sam Luoma asked Region 6 what is the full size of the area they EPA will be sampling and is it homogenous or patchy? Region 6 responded they don't have a full understanding of the extent of the flooded area, but they will at least sample several one square mile pieces. Sam Luoma commented that in order to be able to judge the adequacy of several one-square-mile sections for sampling, it is important to have an idea of the total area in which flood water sediments will be deposited.

Jeff Griffiths reminded people that this is EPA's first look. After considering the results, EPA can use the evidence to decide where and how to focus a more systematic plan. The 24 samples per square mile is fine for an initial approach. Looking for signs of contamination as a clue as to where to sample is a good way to make the best of scarce manpower. He is eager to keep things moving along fast, with all the caveats that belong to initial information.

Sam Luoma agrees that initial data will serve primarily for scoping. However, scoping should look at the breadth of the problem.

Doug Splitstone spoke of his uneasiness over the multiple objectives. Sampling at locations selected by judgment as to potential for contamination (biased sampling) might be adequate to obtain an initial idea of what kind of nasty stuff might be there. When you want to use the data to address human health risk management, however, it is not adequate.

Louis Thibodeaux thinks biased sampling makes sense for an initial investigation, and spoke of two areas where most of the focus is with respect to flooding and sediment deposition: one is an upscale community by Lakeshore near the 17$^{th}$ Street Canal and Lake Pontchartrain, the other is more easterly, near the oil refinery and Chalmet. The latter area would be more likely to show contamination.

Doug Splitstone asked what the decision will be if sample results yield non-detect or results below action levels? There is a statement in the plan that suggests that in this case no further sampling will be conducted.

Sam Luoma asked what about the neighborhoods where no samples will be collected? Won't this lack of information pose a problem for decision making about public safety? Might this not raise complicated social issues or perceptions? He recommends samples from a broad range of affected areas.

Jeff Griffiths thinks, if you begin where contamination is more likely, and follow-up more systematically with other areas, that will be acceptable.

Doug Splitstone understands that, as the water recedes, EPA is taking 24 samples per square mile as areas emerge. Randy Sturgeon of Region 6 confirmed that is correct. They have taken 24 samples per square mile for three areas, so far. In response to this information, several Workgroup members said the sampling of multiple square mile areas changed how they thought of things. The sampling plan indicated to them that only a single one-square-mile area would be investigated. The plan should be revised to make clear that multiple one-square-mile areas will be investigated.

John Maney is concerned about the extrapolation of biased sampling within these areas to others. He thinks with minor additional effort some representative sampling based on probabilistic design would provide a better basis for extrapolation. His individual comments expand on this.

Randy Sturgeon noted that one area of Metairie immediately adjacent to New Orleans, and several areas towards the south end New Orleans has been sampled already.

Dave Dzombak noted that Louis Thibodeaux had raised another issue about sampling in yards rather than in buildings. Louis Thibodeaux had raised concerns about this in his individual comments. He has seen people trying to clean out their houses, and has observed that the relatively calm conditions for flood waters in houses allow more particles to settle there compared to areas adjacent to houses. As the interior of houses is where people will be when they return to clean up and reoccupy, some sampling of interior spaces should be conducted.

Dave Dzombak noted that, as discussed in the sampling plan, gaining legal access to properties would slow down the sampling effort.

Thibodeaux thought, if you want to bias the sampling in favor of collecting nasty materials people will come in contact with, then you would want to sample in the homes. Or, if you couldn't get into homes, into a storage shed or something with similar properties to a home.

John Maney noted that the sampling plan was formulated based on a number of assumptions, such as the assumed comparability of sediments inside and outside of houses, differences between sediment and soil in yards, and others listed in his individual comments. He believes that sampling based on a lot of assumptions will limit the Agency's ability to use the data for multiple purposes, for example, using the data to decide which areas need more sampling.

Dick Gilbert asked about duplicate samples and how defined. Dave Dzombak responded that the plan indicated a duplicate would be taken for every sample, but the Appendix had different information, so he asked Region 6 to clarify. Walt Helmink responded by referring to page 11 of the document, which was one duplicate for every ten. John Maney asked for

clarification as to whether these are duplicates (co-located samples) or split samples. Helmink said they were more along the line of traditional duplicates.

Louis Thibodeaux thinks we want to see if there is an exposure problem if people go back into their homes. This means pathways are important. The initial and subsequent sampling plans should be formulated in this context.

Dave Dzombak and others had raised the issue of the need for additional sampling for microbiological contaminants which they will address later in this call. Another issue was sampling of airborne contaminants as the material dries and becomes airborne.

Louis Thibodeaux said it is very clear from news videos that, where the flood water has receded, there are dark brown green stains on the outside of the houses, and the same can be expected on interior walls and surfaces. There is a surface film all over the areas that were wet and, when they dry, this material will become a dust. Samples of this material might also give some important information in the larger context of sediments.

John Maney said that part of a sampling program involves sub-sampling and the sampling plan is silent on this issue. This is the aliquoting that takes place in the analytical laboratory. For a little more effort, and using co-located sampling, we can get further down the line towards data that can be more useful in assessing the extent of contamination, exposure, and implications for health.

Doug Splitstone said that the sampling plan seems to be aimed at two major objectives: (1) acquire screening data to determine whether there is nasty stuff present; (2) obtain data that can be used to assess exposure and health risk. These two objectives are substantially different in terms of data requirements. The Workgroup has to keep in mind which of these objectives we are discussing.

Dave Dzombak thinks we are viewing this as initial screening to be followed up by systematic screening.

John Maney reminded the group of the statement in the plan (Appendix A, Step 2) that if no contaminants exceed the specified benchmarks, no further screening will be necessary for the contaminant.

Doug Splitstone noted that this is a risk management decision that Region 6 may want to reconsider considering the screening nature of this initial sampling.

John Maney reiterated that a probabilistic approach with duplicate sampling could provide data more useful (than biased sampling in an area that someone thinks might be contaminated) for risk management.

3. ***Are the requirements for containers, preservation techniques, sample volumes, and holding times (Table 4-1) appropriate for the listed analyte categories?*** (2:00)

Sam Luoma noted that glass containers should not be used for metals samples. These samples should be collected in acid-washed plastic bottles, which is the common practice. More detail is provided in his individual comments.

John Maney noted that the containers specified for VOC samples are also incorrect. This issue is addressed in detail in his individual comments.

Dave Dzombak raised the issue of equipment decontamination procedures. Those identified in section 3.5 don't seem to include disinfection, which will be important to avoid cross-contamination of the samples collected for microbial contaminants. More detail is provided in his individual comments.

Dave Dzombak said that the Workgroup mostly was satisfied with those parts of the Sampling Plan that address containers, preservation techniques, sample volumes and holding times for the listed analyte categories. The Workgroup, has, however some concerns about the need for analysis of pathogens (below) which were not among the target analytes.

4. ***Are the analytical methods to be used appropriate for the matrix being sampled?*** (2:05)

Sam Luoma advocates that EPA use wet sieving of samples in the field or lab to isolate the silt/clay cut (< 64 um) which is likely to represent the primary source of human exposure and health risk. The stuff that gets under your fingernails and into the air point to the importance of these fine particles. It is more work, but not a lot more work, and the information you get is much better. You may have larger particles near where the levees broke. It will get you away from as many false negatives with respect to evaluating risk.

John Maney thinks it would be good to do fine sediment in addition to but not in place of whole sediment.. Maney agrees on the importance of fines, but wants to discriminate between the yards that have 1% fines and 99% fines. Also, in some contexts it is useful to know the total contaminant mass and where it is distributed.

Sam Luoma agreed that it would be useful to do both, and not just fines. He reiterated, though, that he expects the human health risk will be primarily associated with the fines.

Barry Lesnik of EPA-OSWER raised a question about the organic analysis methods specified. Direct sample injection without sample preparation is specified. This has a number of implications with respect to detection levels and how the data can be used.

John Maney noted the specified gas chromatographic methods do not detect those strongly polar, labile or large organic compounds that are detectable by LC/MS/MS and are now of increasing environmental concern. EPA's Bill Budde of EPA's Cincinnati laboratory or Barry Lesnik of OSWER could serve as resources to Region 6 on this issue.

Dave Dzombak said that the committee is not necessarily recommending that Region 6 follow EPA analytical guidance uniformly, but that the implications of not following the guidance need to be recognized.

***5. The SAB's advice on constituent analysis would also be appreciated.*** (2:13)

Dave Dzombak thought the list of chemicals was comprehensive, but perhaps too extensive in the sense of including many chemicals that are primarily of concern for chronic rather than acute human health risk. Focusing on chemicals of concern for acute risk would reduce the sampling and analysis burden, and perhaps make it more feasible for sampling a broader geographical area.

Dave Dzombak also said that while fecal coliform is a common and useful indicator of sewage contamination and the presence of pathogens, the workgroup members with microbiology expertise (Jeff Griffiths and Joan Rose) feel very strongly that various individual pathogens should be analyzed. (Joan Rose was not on this call, Jeff Griffiths was.)

Jeff Griffiths said that there are two forms of microbiological contamination in events like this – sewage and environmental pathogens. We know that sewage is present; fecal coliform will provide only limited new information. We should look beyond sewage pathogens. We know there have already been six deaths in the region from *vibrio vulnificus* (bacterium that resides in warm coastal waters) Therefore, pathogens in addition to general measures of sewage contamination should be considered. We know there is sewage contamination. When you can see fecal matter floating around, it is not clear what additional information testing for fecal contamination gives you.

Jeff Griffiths noted that he provided a list of pathogens of concern in his individual comments, as did Joan Rose. Jeff said the two lists are very similar. He is also concerned by leptospirosis which is transmitted by rat urine. There is a large rat population in New Orleans.

Dave Dzombak asked whether there are standard protocols for analyzing for these pathogens in a solid phase like sediment. Jeff Griffiths said that there are standard methods that basically consist of rinsing the solid with distilled water and then placing the rinsate in a culture dish. There are some time limits between sampling and analysis. The standard methods do not cover all of the pathogens listed. Some of the pathogens can only be detected by polymerase chain reaction (PCR) methods.

Dave Dzombak asked about the die-off that can be expected for pathogens in sediments as the wet sediments dry out. Jeff Griffiths reported that many pathogens can survive with very limited moisture. While some of the pathogens will die when moisture contents are very low, others can enter a dormant state and reactivate when moisture content increases later. How long they will survive depends on the pathogen and water content of the material in which they are located . Life expectancy for pathogens in dry materials varies from hours to months or even years.

Fran Kremer from ORD noted that there are standards (defined limits) for pathogens in water, but such standards do not exist for soils and sediments and thus it's not clear how to interpret data on the presence of pathogens in soils and sediments. At what level does a problem exist? Griffiths responded that, if you can culture them, it is definite evidence of viability and that is a concern.

Jeff Griffiths spoke of susceptible sub-populations such as children, the elderly, and people with AIDS.

Dave Dzombak suggested that, with repeated sampling and analysis in an area, you might see changes over time in quantity of viable pathogens that would give you some comfort that risk is being reduced. Griffiths agreed. It will help if you note how long the area has been dry when you sample.

Sam Luoma said this suggests water content should be one of the analytes.

John Maney had three quick comments on analytes:

(1) In the last decade EPA has become interested in organic contaminants that are not gas chromatographable, i.e., polar, labile, or large organic compounds that are only LC chromatographable. LC/MS can be considered for some samples collected.

(2) Particle size analysis would be useful, to obtain an idea of the extent of the fine fraction which will be that most susceptible to airborne transport.

(3) The inclusion of some TCLP analyses should be considered, for some initial information related to whether or not the removed sediment should be treated as hazardous waste.

James Watson works in the area of radiological health. He has no reason to think that there are any radiological health problems, but suggests that some screening analyses on a subset of the samples would be useful to settle the question. This is brought out in his individual comments.

***6. Please comment on the adequacy and the transparency of the quality assurance plan and the plan for project documentation***. (2:27)

Dave Dzombak originally thought there was inconsistency in the discussion of duplicate samples, but this has been discussed earlier on this conference call and clarified. The document might be revised to make it clearer as well.

Doug Splitstone said that, on this call, Region 6 clarified that their objective was to see what is out there. Given that objective, the sampling plan is adequate and transparent. However if the aim is to use the data to assess extent of the contamination, human exposure, or human health risk, then the sampling plan is not sufficient.

John Maney supported Splitstone on this point. He thinks the biased sampling is not necessary; it involves a number of assumptions (such as sampling at locations identified by judgement as likely to be associated with high contaminant levels) that make extrapolation of the data more difficult. For example, if pathogens are the drivers of risk, they may not track with visible stains on buildings. He recommends use of a probabilistic sampling design.

Sam Luoma thinks Maney's comment has merit, but cautions that a purely statistical sampling program can fail to address the pragmatic aspects of sampling and doesn't always produce useful knowledge. A statistical sampling design developed by someone with only a map can lead to a variety of problems. Development of a good sampling design is an art. He would urge Region 6 to use their common sense and think about the sampling biases.

John Maney agrees, but adds that if there is a conceptual model that hypothesizes the release, transport, and dispersion of contaminants, it can be used to better direct both probabilistic and judgmental sampling.

Dave Dzombak summarized that Region 6 should consider a component of probabilistic sampling to complement the biased sampling approach described in the plan. A conceptual model is an important asset for both approaches. Region 6 indirectly outlines a conceptual model in the sampling plan, and Louis Thibodeaux has spoken previously in this call about the value of conceptual models.

Dzombak returned to Doug Splitstone's concern over the potential for overuse of the data, that is, using the data not only for initial screening, but for human exposure and risk assessment. He concluded discussion on that point by stating the general feeling of the Workgroup that this is an important issue that Region 6 should consider carefully as the data from the initial sampling effort are interpreted and follow-up sampling is planned.

John Schaum of EPA noted New Orleans has an land area of 180 square miles of which about half of which flooded, with perhaps 50 square miles now exposed. In this context, he questions whether sampling one square mile at a time is sufficient. Sam Luoma thinks this is a major point. If you can afford to do 50 or 100 square miles at 24 samples each, it might be fine. However, if you can't, then statistical validity and issues of fine scale and broad scale resolution become more important. He would go to fewer samples over a larger area.

Louis Thibodeaux believes that the practical approach to the sampling design problem is to go into areas of the city as they dry out. Acquire samples according to the plan in a piecemeal fashion as things unfold with time. Sam Luoma agrees if there isn't a ceiling on how many samples can be taken.

Doug Splitstone is hearing the data will be used to tell people they can come back into their homes. Then we want to know how certain we are that there are not risks. That is not addressed at all in the sampling plan. Dzombak notes that this is a risk management issue that needs to be decided by Region 6. He suggests the Workgroup should caution Region 6 that, with the sampling plan as currently formulated, use of the resulting data for risk or exposure assessments will be problematical. By changing the sampling strategy to a combination of biased and probabilistic sampling EPA could develop a database better suited to risk management.

Sam Luoma spoke of a flood in North Dakota where the waters ended up in Lake Winnipeg, and in which a pesticide factory was one of the buildings flooded. Initial screenings of the lake sediments did not reveal an impact of the pesticide factory flooding, but later sampling did reveal an impact. This gets back to being very clear about objectives. If the clearly stated objective of the initial sampling is to obtain some basic information about the presence of agents that pose health risk, with a plan to come back and sample in a more systematic way, this can garner trust. But the objectives have to be very clear.

John Maney noted that the project documentation is lacking some of the elements of EPA/QA/G-5 Guidance on Quality Assurance Project Plans.

**B. Other Comments**

At 2:45 Dave Dzombak asked the workgroup if there were additional comments they would like to make.

John Maney thought the sampling plan was a good start. One can see that lessons learned should be captured and incorporated into emergency response guidance documents after this crisis has abated. These documents should undergo peer review and then will be available to help response to future natural disasters.

Dzombak asked EPA to add any additional comments they would like to make at this time.

Mike Broder, concerning pathogenic analytes, noted that hepatitis-A and polio virus are robust organisms that can persist and perhaps should be included for analysis. Also, he spoke about pathogens such as salmonella that may be below the level of detection as a viable organism in dry material, but which can re-generate with addition of moisture. Griffiths completely agreed and referenced his, and Joan Rose's, individual comments.

Dzombak asked Broder, where he would suggest Region 6 look for protocols for testing and interpreting tests for pathogens. Broder responded that the American Society of Microbiology and ASTM have standards methods documents on the recovery and testing of pathogens. It is difficult for labs not accustomed to testing viruses to do so. CDC might be able to help. Griffiths mentioned that there are a lot of researchers who might be willing to help. He thinks it would be fairly easy to identify labs which would be willing to help. Dzombak noted that the SAB network can be used to help with this.

Region 6 said they appreciated the comments and looked forward to the minutes. They appreciate the depth of thought that has taken place in a short period of time.

**3. Public Comment (brief comments only)**

An opportunity for public comment was offered but no one wished to provide any comments.

**4. Summary and Identification of Most Important Points for the Agency's Consideration** (2:50)

**A. Summary by David Dzombak**

**Key Issues for Charge Question 1**

a. Objectives are stated and restated differently within the plan. Objectives should be made consistent. Moreover, Region 6 needs to carefully consider the scope of the objectives. There seem to be two major, inconsistent objectives. The first and apparently predominant objective is to assess in a preliminary way the kinds of contaminants present in various areas – the "Look See" approach. The second objective is to use that information to evaluate extent of contamination as well as to assess potential for human exposure and associated health risk. These latter objectives are not compatible with the screening nature of the plan.

b. There is a danger that the results may be used for purposes much broader than the intended purpose which seems to focus on preliminary investigation. Region 6 should state the limitations very clearly

c. The geographic focus for the sampling plan should be stated very clearly on the first page of the plan.

**Key Issues for Charge Question 2**

a. Most of the Workgroup interpreted the sampling plan as indicating that a single one-square-mile area would be sampled. From our discussions today it is clear that several one-square-mile areas will be investigated. This needs to be clarified in the plan.

b. Focused sampling in selected one-square-mile areas is different than a broader area analysis which would provide more information for scoping purposes. It is recognized that there are practical issues driving the current approach, but the technical, social, and decision making advantages to sampling over a broader area should be considered

c. The plan involves collection of samples in yards adjacent to houses, that is, all samples will be acquired in the outdoor environment. Different materials may be deposited outdoors compared to indoors (where potential for human exposure is likely to be greater). Region 6 may wish to consider some indoor sampling, including surface films on walls and structures.

d. The plan should clarify the procedure for duplicate sampling so it is consistent throughout the plan.

e. As sediments dry, airborne dusts will be created. Particle size distribution for deposited sediments will provide some information about the amount of sediment mass susceptible to suspension in air flows. Plans for air sampling for particulates should start to be formulated (not for inclusion in the current plan).

f. The biased approach used in the plan, involving targeting areas suspected to be highly contaminated and/or accessible because of the drawdown of flood waters, is justifiable. Without large additional effort a probabilistic component could be added that would make the data more useful for purposes beyond initial scoping, such as extrapolation for assessment of extent of contamination.

**Key Issues for Charge Question 3**

a. Avoid use of glass containers for collection of samples for metals analyses; use plastic, acid wasted bottles.

b. Disinfect equipment between sampling to avoid microbial cross contamination

c. Use appropriate containers for VOC samples; the containers specified are incorrect

**Key Issues for Charge Question 4**

a. It would be useful to wet sieve some sediment samples to isolate the silt/clay fraction, and analyze the contaminants associated with this size fraction, which is likely to drive human health risk assessments. Such data would complement the analyses of the whole sediments.

b. Direct injection without preparation for organics will limit the usefulness of the data obtained. Region 6 should reconsider whether they are comfortable with the proposed approach for analyzing organics.

d. The plan does not follow EPA analytical guidance in a number of specific points. These decisions were probably made consciously, but have ramifications, and it is important that these be recognized.

e. TCLP analyses on a subset of samples will start to give Region 6 some information pertaining to management of the sediments after they are removed from properties.

**Key Issues for Charge Question 5**

a. Region 6 should analyze for a number of individual pathogens in the sediment samples.

b. Region 6 should consult with CDC about analyses for pathogens, including which pathogens to target and standard methods for collection, transport, and analysis of samples.

c. Region 6 will need to give thought to how to interpret the results of the pathogen testing, as there are no defined acceptable limits for pathogens in sediments. Microbiological standards developed for wastewater treatment biosolids used in land application may be of some use.

d. Moisture content of sediment samples should be routinely measured because it affects microorganism viability.

e. Particle size measurements should be done on a subset of samples to help assess risk.

f. Radiological analyses on a subset of samples would provide an initial confirmation of the hypothesis that there is not radiological contamination above background.

**Key Issues for Charge Question 6**

g. Some component of probabilistic sampling along with the biased sampling will make the data more useful for assessing the extent of contamination, exposure assessment and health risk assessment. Such assessments will be needed shortly.

b. The sampling plan lacks some elements of the Agency's quality assurance guidance as described in document EPA/QA/G-5 Guidance on Quality Assurance Project Plans. It is not necessary that the plan comply with all elements of the guidance, but the implications of not doing so should be recognized.

**Other Issues**

As we learn going forth on making decisions in this emergency it would be useful to document the decisions so that later, at a more deliberate pace, guidance could

be put together that would be useful for EPA response to urban flooding disasters in the future.

### B. Discussion of Summary by Workgroup

There was no further discussion of the summary.

## 5. Agency Comments

Region 6 expressed appreciation for the time and the SAB is pleased to be of service.

## 6. Wrap-up and Next Steps

The DFO will draft the minutes and provide them to Dr. Dzombak to edit and certify. They anticipate that the minutes will be completed by the night of September 14. They will be posted at the SAB's website later in the week.

After thanking the participants for their efforts, Dr. Dzombak adjourned the meeting at about 3:30 p.m.

Respectfully Submitted: Certified as True:

_____/s/_____ _____/s/_____

Ms. Kathleen White
Designated Federal Official
Environmental Engineering Committee

Dr. David Dzombak, Chair
SAB Workgroup on Residue
Sampling Plan

**Attachments** (paper copies in FACA file)

1. Federal Register Notice
2. Agenda for the meeting
3. Workgroup roster and biosketches
4. Comments prepared by individual workgroup members in advance of the meeting
5. Email approving minutes