PEER Comments upon
Draft Inquiry Report of the Integrity Review Panel
Scientific and Research Misconduct Allegation 2012-001
11/14/12

Public Employees for Environmental Responsibility (PEER) appreciates the opportunity to review and comment on the draft inquiry recommendations of the NOAA Integrity Review Panel (IRP) regarding our January 27, 2012 complaint of Scientific and Research Misconduct by a NOAA employee.

Before detailing a number of glaring omissions, factual errors and unsupported assertions in the IRP draft inquiry report which should be corrected there are three overriding deficiencies which the IRP should also address:

1. **IRP Misinterpreted Its Function.**

The NOAA Procedural Handbook for Administrative Order (NAO) 202-735D: Scientific Integrity states in §5.02 that:

> "The purpose of the inquiry phase is to assess whether a Scientific and Research Misconduct allegation has substance and to determine whether an investigation is warranted."

Unfortunately, the IRP went well beyond that function by doing some sort of investigation upon which they made findings of fact. Section §5.03e states that the Determining Official (DO) makes the decision if an investigation is warranted. But the IRP seems to have done an investigation without approval from the DO. To illustrate this blatant misapplication of its role, the draft is replete with findings of fact, as if the IRP were authorized to do an investigation. For example:

- On Page 9 of the draft, Dr. Rago states "Omission of FTV estimates in the July 30 presentation appears to be unintended…" How can such a conclusion be drawn without an investigation?

- On page 10, Dr. Rago states "Hence, the chance that an earlier tabular summary could have replaced the Appendix 1 table seems probable." How can this conclusion be credibly drawn based solely upon a review of paper submission?

Perhaps the clearest indication that the IRP had overstepped its role in the inquiry phase comes in Dr. Hoke's statement on page 13 that "The standard used in this inquiry was 'preponderance of the evidence' and not 'beyond reasonable doubt.'"

Preponderance of evidence is a standard for fact-finding based on an investigation. This IRP is not supposed to make conclusive findings of fact in the inquiry phase. Instead, it is to determine if the allegations are substantive – which they clearly are. It was this point that Dr. Westley sought to clarify when she wrote on page 17:

> "I note that in this inquiry phase, we are reviewing the preponderance of the evidence that the allegation has substance and warrants investigation, not necessarily the preponderance of the evidence that scientific misconduct occurred."

The appropriate standard for the IRP is whether the complaint stated a *prima facie* case (established by sufficient evidence on its face) for proceeding to an investigation – the next step in the process laid out in the NOAA Procedural Handbook. At the investigative stage, the panel has expanded powers to collect addition evidence and broaden the scope of the investigation §5.03a and §5.03b. Only in the investigative phase can contradictory evidence be carefully analyzed and witnesses questioned so that credible finding of fact can be made.

In this instance the majority of the IRP panel made findings of fact based upon no recognizable or consistent process.

Unless the IRP is concluding that our allegations are frivolous, then they are substantive. The fact that two of the members, Drs. Rago and Hoke, had to resort to mental gymnastics in a strained attempt to discard the allegations before an investigation could be done in itself shows the substance of the allegations. If the allegations are of substance, they must be referred as such to the Determining Official so he/she can approve a proper investigation– nearly a year after this complaint was lodged.

2. Sharp Disagreement within Panel Is Sufficient Basis for Investigation.

The fact that one of the three panelists made findings widely divergent from the other two indicates that an investigation is warranted. If, as is said, reasonable minds can disagree, that is surely the case here.

In this case, Dr. Westley concluded, among other things –

- With respect to Allegation 1, "I find the use of the term PIV in the title of the final report to be inaccurate, and I find it difficult to believe that the Plume Calculation Team agreed to this wording. Further investigation would be necessary…"; and

- With respect to Allegation 2, "Because the Respondent received clear feedback from two reviewers concerning the weakness in the report, and because the Respondent had time to respond to these reviewers, I am left with the impression that the Respondent chose to leave the report in its current, confusing state in order to marginalize the contributions of certain team members and to hamper the communication of higher flow rate estimates to key decision makers and to the public."

If the Determining Official employs a majority rule process (which we fear to be the case) then not only our concerns but the concerns of a respected NOAA scientist, Dr. Westley, will be swept under the rug. Moreover, this drive for "consensus" on matters of scientific disagreement is precisely the underlying foundation for our complaint of scientific misconduct. At the heart of our complaint is that Dr. Lehr, in order to present a unified front to policymakers, suppressed or marginalized the higher flow rate estimates which he took to be outliers. We now know the highest estimates of the Plume Team were the most accurate (best agreement with the

government's final official estimate). With this IRP draft, NOAA again seems to avoid an investigation into a deadly serious matter by closing ranks.

3. Inability to See Forest for the Trees.

While PEER made several detailed and interrelated allegations, the basis of the allegations is simple and straightforward:

- Dr. Lehr wrote the body of the Final Report and was the lead author on the Final Presentation to key decision makers
- Dr. Lehr omitted the two highest estimates (61,000 bpd and 62,500 bpd) of the oil leak rate from both the Final Report body and Final Presentation to key decision makers who had assembled to generate the government's revised and final estimate of the oil leak rate
- Not only did Dr. Lehr omit the highest estimates, but he told key decision makers that the Plume Team experts concluded that the oil leak rate "could be as large as 50,000 bbl/day." This shows clear intent to mislead key decision makers.

All of these allegations obviously have substance.

Dr. Lehr' actions all sprung from one motive and served one purpose—to hide the higher flow-rate estimates from policymakers and the public.

While one or perhaps two mistakes might be credibly passed off as inadvertent, the repeated pattern of slanting all estimates in one unmistakable direction is difficult to ignore – or dismiss as unintended. The Final Report body and Final Presentation show a consistent pattern of omitting the highest estimates, and leading the readers and key decision makers to believe that the highest estimates were 50,000 bpd. Yet, two members of the panel accepted, without question, all of Dr. Lehr's explanations or excuses, even that the omission of the two highest estimates was "a cut and paste error."

It is indisputable that the highest estimates were omitted by Dr. Lehr from his body of the Final Report and from his Final Presentation to key decision makers. Dr. Lehr has admitted to omitting the highest estimates. Drs. Rago and Hoke make a tortured attempt to dismiss these obviously substantive allegations by relying on a misunderstanding of the facts and at times simply making up erroneous guesses. Because the allegations have solid substance, our rebuttal comments to Rago and Hoke's sections of the inquiry report will show that they –

(1) Did not address some of the allegations, rather simply stated facts that are not relevant (e.g., members got to attach an appendix and respond to peer reviews);

(2) Consistently misstated or misunderstood basic facts; and

(3) In some cases, simply made up baseless, erroneous conclusions upon which they dismiss an allegation (e.g., government's official estimate on June 14, 2010, of 35,000 to 60,000 bpd represented the highest estimates of the Plume Team, although both the 61,000 bpd and 62,500 bpd estimates were developed after June 14).

Perhaps, these failures were due to the IRP's misapprehension of the role of the Flow Rate Technical Group (FRTG). After public outcry and accusations from Congress that the government and BP were dramatically underestimating the oil leak rate, the FRTG was convened to –

a) Provide credible, independent estimates of the oil leak rate, and
b) Give policymakers and responders the worst case estimates so that spill response strategies would have a greater chance of success.

By his actions, Dr. Lehr undercut both of these objectives.

Throughout FRTG's work it was widely thought that physical measurement of the leak was not possible. Manipulating spill rate estimates provided to the public down to 25,000 or 35,000 bpd instead of 60,000 bpd undermined the credibility of the administration's efforts. Even more significantly, the President's National Commission concluded that underestimates of the size of the spill hampered clean-up efforts and caused numerous attempts to cap the well to fail.

What follows are our specific comments about findings from IRP members. Comments by PEER are **in Arial Bold font.**

Executive Summary

This report summarizes the recommendations of the NOAA Integrity Review Panel regarding allegations of Scientific and Research Misconduct by a NOAA employee. The allegations concern conduct that occurred in 2010 prior to the adoption of NOAA's current Scientific Integrity Policy, NAO 202-735D (Policy). Consequently, the Integrity Review Panel (Panel), established by the Deputy Under Secretary for Operations (DUSO), applied the standard for evaluating misconduct that was in effect when the alleged scientific misconduct occurred. Under this standard, misconduct is defined as, "fabrication of results, plagiarism, or clear misstatement of facts."[1]

3.1 Scientific Standards for Evaluation

This matter involves allegations regarding conduct that pre-dates NOAA's current Scientific Integrity Policy (Policy) which was put into effect on December 7, 2011. When the allegations were referred for inquiry, the DUSO explained that the current Policy would not be applied retroactively; rather, the inquiry would be based on standards of conduct in effect at the time of the alleged misconduct. The following section describes the pre-existing standards applicable for the current inquiry.

Claims against NOAA scientists regarding conduct that occurred prior to December 7, 2011, were evaluated under general principles of scientific misconduct long-understood to apply to professional scientists. Specifically, misconduct is defined as "fabrication of results, plagiarism,

[1] This standard was informed by the White House Office of Science and Technology Policy guidance on the appropriate standard of conduct applicable to Federal scientists, 65 Fed. Reg. 76260 (December 6, 2000).

or clear misstatement of facts." This standard was confirmed by the DUSO in an email to the Panel Chair on June 6, 2012. The White House Office of Science and Technology Policy (OSTP) provides additional guidance on the appropriate standard of conduct for federal scientists.[2] In 2000, OSTP published guidance on the establishment of research misconduct policies for federally-funded research. That guidance defined a number of terms useful in the administration of research misconduct complaints, and the entirety of the OSTP guidance was useful in informing the current inquiry.

Comment of Complainant:

The IRP states that misconduct is defined as "fabrication of results, plagiarism, or clear misrepresentation of fact." While this phrase is in quotes it is not from the Federal Policy on Research Misconduct whose definition of research misconduct also includes falsification, which is defined as:

> **"Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research record is not accurately represented in the research record."**

The IRP should reassess our allegations under the full definition of scientific misconduct, including the standard of falsification.

5. DETAILED FINDINGS BY INTEGRITY REVIEW PANEL MEMBERS

5.1 Recommendation of Integrity Review Panel Chair Paul Rago

I have reviewed the Complainant's allegations and documentation available to the NOAA Integrity Review Panel. The following sections describe my analyses of the allegations. Only the title of the allegation is included herein; a complete listing of the allegations is provided in Section 2.0. Each allegation consists of several assertions. I have chosen to paraphrase the key assertions and respond individually to each. I then follow with a summary statement on each allegation individually and conclude with a summary statement (5.1.5) on all allegations by the Complainant.

5.1.1 Allegation 1. Falsification of Scientific Findings

5.1.1.1 Assertion—Respondent intentionally falsified scientific product by naming it "PIV"

Response: The report was the product of the Plume Team. While it appears that the Respondent wrote the introduction and executive summary, all of the team members had an opportunity to comment on the title and its contents prior to release. Moreover, each team member had the opportunity to prepare individual appendices that allowed each member to clarify the methodology and appropriate nomenclature for their methods. External experts prepared written reviews of each of the Team member's reports but not every External Reviewer had time to comment on each Appendix report. The evidence shows that Team members were

[2] 65 Fed. Reg. 76260 (December 6, 2000) "Federal Policy on Research Misconduct."

afforded the opportunity to provide comments or rebuttals to the assertions of the External experts. Hence there was ample opportunity for the Plume Team to clarify the title of the final report and its organization.

Complainant Comment:

The substance of this allegation was not addressed let alone rebutted – that is the <u>body</u> of the Final Report and Final Presentation to key decision makers (both authored by the Respondent) did not accurately reflect the work of the Plume Team.

While members could submit comments on the Final Report body, all comments critical of automatic PIV were ignored and not incorporated in the Final Report body or the Final Presentation.

There is clear and abundant evidence that three members of the Plume Team concluded that automatic PIV was inappropriate and was underestimating the oil leak rate. Lehr completely ignored their comments and conclusions.

The ability of members to submit appendices does not meaningfully mitigate this misconduct, as their work is effectively obscured by Dr. Lehr's body of the Final Report and Final Presentation. As Dr. Westley states regarding the Final Report body which is included the FRTG Assessment report, *'In other words, a reader who begins by reading the FRTG Assessment would have to be diligent indeed to find the full range of estimates provided by the Plume Calculation Team since they are not included in the "summary section."*

An email from Mr. Shaffer, a member of the Plume Team, to all members of the Plume Team on June 23, 2010, expressed reservations about the use of the automatic PIV methodology but did not make any suggestions about changing the terminology in the final report. Mr. Shaffer did not suggest any wording changes to the report that would have expanded its scope to other related approaches or a more restrictive usage of the term "PIV".

Complainant's Comment:

In Mr. Shaffer's June 23, 2010, email, he did point out that he had reached a conclusion that PIV was inappropriate for this application, and that it was producing underestimates of the oil leak rate. The title "Deepwater Horizon Release Estimate by PIV" clearly shows that Dr. Lehr was reporting only one technology, PIV. Yet three members of the Plume Team concluded that PIV was inappropriate for this application and abandoned PIV for a different technique. Dr. Lehr's Final Report body and Final Presentation do not reveal that there were two different techniques used, neither did Dr. Lehr report any criticism of PIV. Mr. Shaffer's comments make it obvious that the title is inappropriate. He was not the author of the Final Report body. It was Dr. Lehr's responsibility to change the title to accurate reflect the findings of the Plume Team.

The term PIV is used as a general term to describe the use of video images of turbulent flow to deduce the overall rate of fluid flow.

Comment by Complainant:

Not true. PIV is not used in a generic sense. PIV is a specific, automatic (done by computer) analysis technique that analyzes video using cross correlation of interrogation spots/regions. Manual feature tracking is an entirely different technique that relies on manual tracking of visible flow features by a human, not a computer. The

Final Report body describes the PIV technique only. No mention is made of a different technique that uses manual tracking of visible features by a human.

The Final report distinguishes the methodology used in this report from "true PIV" by noting the reliance on "interrogation spots" and a sampling methodology to determine flow.

Comment by Complainant:

The panel member seems to have a fundamental misunderstanding of what PIV is. PIV uses cross correlation of interrogation spots.

Numerous assumptions are required to estimate flow including the ratio of gas to liquid, temporal variation in these ratios, and the behavior of gases and liquids under pressure. Throughout the written record, PIV is sometimes used in a restrictive sense to refer to automated software. In other instances, PIV is used in a generic sense to characterize manual analysis of features that may not be as easily identified by an automated computer algorithm.

Comment by Complainant:

This is absolutely not true. The term PIV was never used to describe the manual feature tracking technique. We ask the panel member to show us where in any part of the Final Report, its appendices, or the Final Presentation that a member of the Plume Team called the manual feature tracking technique "PIV."

One of the alternative methods, Feature Tracking Velocimetry, essentially uses manual tracking of larger "interrogation spots" which are called features.

Comment by Complainant:

The panel member is mistaken. Manual feature tracking does NOT use interrogation spots in any way.

Mr. Shaffer, in an email response to Dr. Savas on May 26, 2010, notes that

> "the various "PIV" variants we are using are not strictly what engineers would call PIV. But given that the audience will be the general public, I think calling this "PIV" is close enough. Myself, I'm using a new "PIV" technique that does not use any correlations methods such as those used in traditional double-pulse PIV."

Comment by Complainant:

This serves to show that the panel member does not understand the timeline of the Plume Team's work. In May, when the Plume Team started its work, ALL of the members of the Plume Team tried to use automatic PIV to measure the velocities of the oil leak jets. No one was using manual feature tracking or discussing it. Only after trying PIV for a couple weeks, in mid June, did several team members conclude that PIV was inappropriate for this application and switch to a different technique, manual feature tracking.

The topic of the discussion of May 26, 2010, from which a quote from Mr. Shaffer is shown, was that PIV is a laboratory technique in which velocity fields of a transparent fluid are measured by recording the motion of small seed (added by the user) particles that are being illuminated with a carefully controlled sheet of laser light that is perpendicular to the camera. Dr. Savas's concern was that we were calling the technique PIV, but the fluid was not transparent, we were not adding seed particles, we were not illuminating with a sheet of laser light, and the camera's line-of-view was not normal to the laser sheet.

The discussion surrounding Shaffer's quote had nothing to do with manual feature tracking or what to call it. He was not saying that the term PIV could be used for both the automatic PIV technique and manual feature tracking. On May 26, 2010, no one on the Plume Team was using manual feature tracking or discussing it. He was simply saying that the general public would not distinguish so much detail about the PIV technique, so calling the application of automatic PIV software to the oil leak videos in a non-traditional way was OK for the general public.

No one on the Plume Team proposed using the term PIV to describe both the automatic PIV technique and the manual feature tracking technique. The members of the Plume Team, including Dr. Lehr, know that they are two distinctly different techniques.

5.1.1.2 Assertion—Only three of the thirteen members of the Plume Team used PIV for their official estimates of the oil leak rate.

Response: A review of those Appendices in the Final Report reveals that four of the five authors used PIV or a variant thereof.

Comment by Complainant:

The panel member is mistaken about the number of estimates. There are eight estimates in the Appendices. The following submitted estimates –

1. **Aliseda (Univ. Washington)**
2. **Bommer (Univ. Texas, Austin)**
3. **del Álamo (UCSD)**
4. **Lasherus (UCSD)**
5. **Leifer (UCSB)**
6. **Savas (Berkeley)**
7. **Wereley (Purdue)**
8. **Shaffer (NETL)**

Dr. Lehr did not report the estimates by Bommer, Leifer or Shaffer in either the Final Report body or the Final Presentation. NIST did not report the estimate by Bommer. No explanation is given for the exclusion of Bommer's estimate.

The identities of the scientists are not given in the final report. An earlier report (June 8, 2010) of Possolo and Espina, statisticians from the National Institute of Standards and Technology, lists estimates from six named experts. The Respondent reported in his written testimony (July 23, 2012) that the identification of individuals was not acceptable

to some members. In the final report, Appendix 1, Possolo and Espina do not reveal the identities of the individuals supplying estimates. However, they do reveal that Expert G's estimates arrived on July 13. I also note that McNutt et al. (2011, p. 4 and Table 1) identifies four (not three) experts (A, B, C, and E) who applied PIV analyses. Thus, of the seven distinct estimates of oil flow rate prepared by the Plume Team, four of them used PIV. In normal usage, 4 of 7 constitutes a majority and justifies the use of the word "most."

Comment by Complainant:

The paper by McNutt et al. included estimates from outside of the Flow Rate Technical Group. The four experts who used PIV are Aliseda, del Álamo, Lasherus, and Wereley. del Álamo was not a member of the FRTG Plume Team. In normal usage, 4 out of 8 or 4 out of 13 does not constitute a majority.

The point of this allegation is that the Final Report body and Final Presentation list thirteen members of the Plume Team, then Dr. Lehr attributes the estimates he reports to "most" of the experts. A reader or decision maker has no way to know that the majority is not the majority of the 13 listed members.

5.1.1.3 Recommendation on Allegation #1:

I do not believe that the Respondent intentionally falsified the report by using the term PIV in the title of the Plume Team's Final Report. Distinctions among the methods, as described in the Appendices, are important but not critical for conveying the uncertainty among the various methods and investigators.

Comment by Complainant:

Again, the substance of this allegation is not addressed. Dr. Lehr omitted unquestionably important facts from decision-makers by describing results from only one technique, PIV, while knowing full well that certain team members had abandoned PIV and used a different technique

Respondent's contention that he meant the term PIV to mean both technologies stretches credulity. At the least, it would take an investigation to determine whether his assertion was credible.

Respondent was also aware that the non-PIV methods were producing markedly higher estimates but he chose to omit and obfuscate this crucial information.

Respondent lists 13 Plume Team members and then says that the majority used PIV for their estimates. Four out of 8 or four out of 13 does not constitute a majority. Moreover, nowhere in the body of the Final Report or Final Presentation does Respondent reveal that only 8 of the 13 members submitted estimates. In short, it is clear that the Respondent was inaccurately portraying the work as a consensus product when it obviously was not.

The available evidence suggests this allegation does not have sufficient substance to warrant investigation.

5.1.2 Allegation 2. Failure to Objectively Consider Conflicting Findings

5.1.2.1 Assertion—Respondent intentionally omitted any discussion in his Final Report and Final Presentation on the use of a different methodology.

Response: Overall, the information in the Final Report was thorough and allowed for a full exposition of the alternative methods by the individual authors in the appendices.

Comment by Complainant:

Once again, the panel member does not address the allegation. The fact that appendices were attached is not relevant and it does not change the fact that Dr. Lehr's Final Report body and Final Presentation do not reveal that tried PIV but abandoned it and used a different technology.

The Final Report was prepared and peer-reviewed by six external experts. Plume Team members had the opportunity to provide comments to the reviewers before preparation of the final draft. It appears that the report was prepared between June 13 when the final estimates were submitted to the NIST statisticians and July 21 when the final report was issued.

Comment by Complainant:

The fact that appendices were peer reviewed is irrelevant. This does not change the fact that Dr. Lehr's Final Report body and Final Presentation do not reveal that some Plume Team members tried PIV but abandoned it and used a different technology.

The final report and the appendices were reviewed by external experts. None of their comments, including those critical of the main body of the report, were edited. Team authors also had the opportunity to respond to the external experts. The Final Report was made available to decision makers before the "Final Presentation" was made on July 30, 2010. Most of the appendices summarize methods that depart from the more restrictive use of the term PIV. It should be noted that even within the methods labeled as FTV (Feature Tracking Velocimetry) the exact methodology differs among investigators.

Comment by Complainant:

There were two distinctly different techniques used to measure velocities. One technique is an automatic analysis technique, the other is a manual technique done by hand. The fact that authors used different names for the automatic technique or different names for the manual technique is not relevant. Neither is the fact that there were slight variations in the way members applied the automatic technique or the manual technique relevant.

The relevant point is that Dr. Lehr's Final Report body and Final Presentation only describe one technique, the automatic PIV technique based on cross correlation of interrogation spots. The Final Report body and Final Presentation do not reveal that an entirely different technique based on manual tracking of features by hand was used, or that those using the manual method first tried the automatic method found it to be inappropriate for this application.

This is to be expected since the identification of features relies on "the human brain as an expert system to painstakingly choose large and fast features to track" (McNutt et al. 2011). Most of the

Final Report is devoted to highlighting the range of scientific viewpoints rather than quashing them.

5.1.2.2 Assertion—The accurate estimates by FTV were in the range of 50,000 to 60,000 bpd, but Respondent did not report the estimates to key decision makers or to the public.

Response: The "accuracy" of the FTV estimates was not known at the time the report was prepared. The accuracy of the higher estimates was first documented in the primary scientific literature with the publication of the McNutt et al (2011) report, a full five months after the Plume Team completed it work.

Comment by Complainant:

Neither was the accuracy of the PIV estimates known at the time the Final Report body and Final Presentation were written. How accurate or not the higher estimates were is not an issue. The issue of this allegation is that they were not reported by Dr. Lehr.

The key decision makers, supported by FRTG of which the Plume Team was a part, released an official estimate of 35,000 to 60,000 on June 15, 2010. This was more than a month before the Final Report of the Plume Team was released. The key decision makers referred to in the allegation had already made a decision on the magnitude of leak, and the final report of the Plume Team had been available for more than a week before the Final Briefings on July 30 and July 31.

Comment by Complainant:

These comments do not address the allegation that the Final Report body and Final Presentation omitted the highest estimates of the Plume Team which were developed with the manual feature tracking method, not PIV. The fact that an estimate of 35,000 to 60,000 bpd was released on June 14, 2010, has no relevance to this allegation.

The estimates of 61,000 bpd and 62,500 bpd were developed after the government's June 14, 2010, estimate. The key decision makers convened on July 30, 2010, to develop a new and final estimate of the oil leak rate. All teams that generated estimates gave presentations at the July 30, meeting.

Dr. Lehr's presentation not only omitted the estimates of 61,000 bpd and 62,500 bpd, but it misled decision makers to believe that the highest estimates of the Plume Team were in the range of 50,000 bpd. After each team gave their presentation, a discussion session was held to generate a new estimate. There is no doubt that Dr. Lehr's July 30, 2010, presentation influenced decision makers.

5.1.2.3 Assertion—Respondent failed to "objectively consider conflicting data" and failed to "accurately report results" to key decision makers.

Response: This assertion is not supported by the evidence. The final report of the Plume Team had all of the estimates, including those derived by the Plume Team, and those subsequently derived by individual members in their separate reports in the Appendices. The Final Report of the Plume Team was made available to key decision makers.

Comment by Complainant:

Again, the panel member does not address the allegation. The allegation is that Dr. Lehr wrote the Final Report body and the Final Presentation, both of which failed to consider the estimates from manual tracking that conflicted with the lower estimates of automatic PIV, thereby also failing to accurately report results to key decision makers.

5.1.2.4 Conclusion on Allegation #2: The July 21, 2010, final report of the Plume Team incorporated a summary of the consensus views of the team, individual appendices prepared by individual investigators, a complete set of unedited reviews by six independent experts, and rebuttals to the reviewers by individual team members. The scientific debate was fully documented. The process reflects a high degree of scientific transparency uncommon in the peer-review literature. The full documentation of the Plume Team's findings was available in a written form to decision makers and their staff before the verbal briefings on July 30-31, 2010.

The available evidence suggests this allegation does not have sufficient substance to warrant investigation.

Comment by Complainant:

The appendices and peer reviews do not address the allegations that the body of the Final Report and Final Presentation misrepresented the findings of the Plume Team. Simply because findings of the Plume Team are in the appendices does not give the Respondent license to misrepresent the findings of the Plume Team by omitting the highest estimate by FTV from the body of the Final Report.

The fact that the accuracy of the FTV estimates were not known at the time accentuates the reason why they should have been conspicuously in the mix for decision-makers rather than buried in appendices presented without context.

The panel member's assertion that high-level decisions about the government's final official estimate of the oil leak rate had been made before the July 30, 2010, presentation by Dr. Lehr, is incorrect. It appears to be an assertion without basis or simply an inaccurate guess. The purpose of the July 30, 2010, meeting was to hear presentations from all teams who generated estimates of the oil leak rate, then to determine the government's final official estimate.

After all presentations were given on July 30, 2010, a discussion session was held to reach a consensus on the government's final official estimate. The discussion was led by Dr. Tom Hunter, former Director of Sandia National Laboratory. Dr. Hunter's Problem Statement for the post presentation discussion session was –

> **"The intent of this meeting is to review the different methods, evaluate the uncertainties, and to come to consensus on a revised, more informed estimate on flow."**

In the sentence before Respondent quotes the government's estimate of June 14, 2010, he states that:

> **"The best estimate of the PIV experts were [sic] for a flow of 35,000 to 45,000 bbl with the possibility that the leak could be as large as 50,000 bbl/day."**

His statement that the Plume Team concluded that the highest estimate was 50,000 bpd, reinforces rather than refutes the fact that Respondent deliberately omitted the higher estimates of 61,000 bpd (Shaffer) and 62,500 bpd (Leifer).

5.1.3 Allegation 3. Prevention of Conflicting Views from Being Reprorted to Key Decision Makers.

5.1.3.1 Assertion—Respondent prevented members of Plume Team who used FTV from communicating their findings to key decision makers

Response: The evidence suggests that Mr. Shaffer was permitted to participate in a high level briefing to Secretaries Chu and Salazar on June 14, but Shaffer was not chosen to serve as the lead for this presentation. Selection of the leads for this presentation was made by Dr. Marcia McNutt, not the Respondent. Details on justification for this decision are provided in email correspondence between McNutt, the Respondent, Shaffer, and other Plume Team members on or about June 17, 2010. McNutt argued that Shaffer had not met the standards of openness, documentation, and peer review within the Plume Team to justify his serving as lead presenter of the Team's findings. The direct presentations of Lasheras and Savas represented the two methodologies – PIV and FTV.

Comment by Complainant:

The June 14, 2010, meeting has no relevance to this allegation. The panel member has a serious misunderstanding of what happened at the June 14, 2010, meeting.

During the June 14, 2010, meeting with Sec. Chu and Sec. Salazar, Juan Lasheras gave a presentation that purported to be a presentation of the Plume Team's entire work. He did not mention the FTV technique. During the meeting, Savas and Shaffer had to ask to present their FTV estimates. Dr. Lehr did not schedule their presentations, which were simply oral explanations since they were not asked to prepare slides.

The statement that "McNutt argued that Shaffer had not met the standards of openness, documentation, and peer review within the Plume Team" is irrelevant and a misstatement of fact. McNutt stated that Mr. Shaffer's report had not been submitted yet. She knew that his report was undergoing an internal review at NETL. None of the Plume Team's work had been peer reviewed by June 14, 2010.

The July 30 and July 31 meetings were a combination of face-to-face meetings with key decision makers and a conference call for individuals who could not attend. The meeting was organized by Sandia National Labs not the Respondent. The actual list of participants is not known to the Panel.

There is a factual error in Allegation 3. The Respondent was not present at the meeting. The Respondent contributed to the presentation, but it was delivered by other Plume Team members. Omission of FTV estimates in the July 30 presentation appears to be unintended because the report of the Plume Team was already a matter of public record, verifiable by all in attendance.

Comment by Complainant:

Whether or not Dr. Lehr gave the actual presentation is irrelevant because he is listed as the first author. He is responsible for the content of the presentation.

Concluding that the omission of FTV estimates was unintended is a finding of fact and not within the scope of the inquiry phase. This conclusion is not credible. The evidence shows that the omission was intentional. For example, in Dr. Lehr's conclusions, he leads decision makers to believe that the highest estimates of the Plume Team were 50,000 bpd. If he said the highest estimates were above 60,000 bpd, the excuse that the omission was unintentional might be credible. But that is not what Dr. Lehr said.

5.1.3.2 Assertion—Members who used FTV were not informed of the final presentation.

Response: The referenced meeting was organized by staff at Sandia Lab, not the Respondent, so the Complainant's attribution of this conduct to the Respondent is not supported by the record.

Comment by Complainant:

Dr. Lehr chose who would attend the July 30, 2010, meeting on behalf of the Plume Team. It is true that he chose only members who used PIV to attend the meeting and give the presentation. This allegation absolutely has substance.

5.1.3.3 Conclusion on PEER Allegation #3

Participation in the presentations to various meetings with decision makers was not controlled by the Respondent. E-mail evidence provided by the Respondent confirms that Mr. Shaffer did not make the presentation on June 14 for the Team because other Team members, representing both PIV and FTV methods, were more prepared to report the findings of the Plume Team.

The available evidence suggests this allegation does not have sufficient substance to warrant investigation.

Comment by Complainant:

This has nothing to do with the June 14, 2010, meeting. Once again, the panel member does not address the allegation. An investigation is needed before a finding can be made that the Respondent did not select the participants of the July 30, 2010, meeting. It is true that the participants from the Plume Team only used PIV, and that the members of the Plume Team who used FTV and disagreed with PIV, were not informed of the July 30, 2010, meeting.

5.1.4 Allegation 4. Fabrication of Findings and Failure to Provide Traceability of Data

5.1.4.1 Assertion—Respondent added an additional estimate by PIV from a scientist who was not a member of the plume team, coerced members to alter their data and did not inform other Team members or public of this decision.

Response: Individuals who made estimates in the Table on 15 are not identified because several Team Members objected to an earlier report (June 8, 2010) that provided the first names of each individual. The Respondent reported in his written statement (July 23, 2012) that the identification of individuals was not acceptable to some members. The principle of anonymity was also applied in the McNutt et al (2011) publication in PNAS, a publication co-authored by Savas and Shaffer, both of whom were on the Plume Team.

In Appendix 1 of the July 21, 2010 Final Report of the Plume Team, the NIST statisticians Possolo and Espina analyzed data from from a total of 7 individuals. Five of these individuals provided estimates at the June 13th meeting of the Plume Team in Seattle. Two additional estimates that arrived after that. As noted in Appendix 1 of the Final Report (p. 16), Expert F's estimate was extracted from his contribution to the final report. Possolo and Espina refer to Expert F'smethod as manual imaging velocimetry. Expert G's estimate arrived in a separate transmittal on July 13, 2010. Contrary to Allegation 4, the origin of the estimates is provided in the Final Report. No addition was made by the Respondent or NIST Plume Team members. It should be noted that the June 8 report of Possolo and Espina contained six estimates, not five. Possolo and Espina note that estimates from Shaffer were not included because other experts were estimating average volume of oil spilled while Shaffer was estimating maximum volume.

Comment by Complainant:

If the panel member believes that there were four estimates from members of the Plume Team, we ask that he produce the names of the four members.

The fact is that the Respondent added an estimate from Juan C. del Álamo of UCSD who was not a member of the Plume Team and did not participate in the deliberations of the Plume Team. Furthermore, each member of the Plume Team representing an organization was asked to submit one estimate. Dr. Lehr allowed UCSD to submit two estimates in order to promote the estimates by PIV. This is a clear fabrication of the findings of a scientific team.

A primary piece of evidence by the Complainant is the difference in the number of rows in table presented to decision makers on July 30 from the table included in the Final Report of the Plume Team published on July 21, 2010. The Respondent acknowledged that he made a cut and paste error in the slide presentation and failed to use the final table from page 15 of the report. I note that there is no difference in the values for the first 5 rows of the tables, supporting the Respondent's claim that these values were a cut and paste error.

Comment by Complainant:

There would also be no difference in the values of the first five rows of the tables if the Respondent had intentionally omitted the last two estimates, which were the highest estimates of the Plume Team.

It is also noted that both of the estimates in question for Experts F and G were not available on June 13, a critical date corresponding to a meeting of the Plume Team that preceded a teleconference call and meeting with Secretaries Chu and Salazar on June 14. Hence, the chance that an earlier tabular summary could have replaced the Appendix 1 table seems probable.

Comment by Complainant:

This is a finding of fact and not within the scope of the inquiry phase. The table and the numerical values in it did not exist before June 13, 2010.

The FRTG and its Plume Team were created because the public, the press, and many in Congress believed that the government and BP were intentionally underestimating the oil leak rate. The FRTG was created to generate accurate estimates to restore the faith of the public and to guide the response efforts. The Deepwater Horizon oil leak was

perhaps the worst environmental event in the history of the U.S. The work of the Plume Team was under intense scrutiny by the press.

The July 30, 2010 presentation was to the highest level of decision makers: the Secretaries of Energy and Interior, the Director of the USGS, the Directors of three National Labs. In this context, to believe that a senior PhD level scientist would accidentally omit the highest estimates is absurd. Furthermore, there were two other authors of this presentation. So, all three authors would have had to make a cut-and-paste mistake. This is simply not believable.

Furthermore, there is evidence in the paragraph above the table that shows the omission was intentional. In the paragraph above the table, key decision makers are told that the highest estimates of the Plume Team were 50,000 bpd.

There were only seven estimates of the oil leak rate using analysis of video. It is just not believable that the omission of the two highest estimates was a mistake.

Finally, I note that the Final Report of the Plume Team was available to all decision makers well in advance of the July 30 and 31 meetings.

Comment by Complainant:

This is not relevant to the allegation. The allegation is about the Final Report body and Final Presentation. Key decision makers are not going to read 200 pages of highly detailed technical discussion in the appendices. They are going to trust the leader of the team to accurately summarize the findings of the team.

5.1.4.2 Assertion—Respondent altered the estimates by PIV to make them appear identical and more consistent.

Response: The methodology to analyze the Plume Team's estimates is clearly specified in Appendix 1 of the Final Report. Appendix 1 was prepared by Plume Team statisticians Possolo and Espina. They used a well-established method to combine separate estimates into a composite value. The methodology takes into account the mean and variance of the individual estimates and the qualitative "degree of confidence" the authors had in their estimates during a June 14 conference call. An additional assumption of Possolo and Espina was that the estimates were normally distributed. They also adjusted the estimates for conversions related to thermodynamics and oil to gas ratios. The composite distribution of estimates is polymodal and highly skewed with a heavy right hand tail with values ranging up to 123,000 bpd. The lower tail of the composite distribution excludes estimates that fall below the volume of oil actually being recovered from the Top Hat (24,000 bpd). Hence the statisticians, not the Respondent, concluded that truncation of estimates below 24,000 bpd was justified. McNutt et al (2011) also included this truncation principle in their evaluation of the flow rates. I also note that left truncation of the composite distribution results in an overall estimate of discharge that is higher than would be obtained otherwise.

5.1.4.3 Conclusion on PEER Allegation #4

The decision to not identify the individuals associated with each estimate appear to be a joint decision by the Plume Team. There was adequate time to have raised this issue within the team prior to publication of the Final Report. No additional estimates advocating the PIV method were included. All of the Plume Team members who made estimates are identified on Page 1 of the

Final Report. Differences in estimates attributable to the Respondent were in fact the results of decisions made by Team Members from NIST (Possolo and Espina).
The available evidence suggests this allegation does not have sufficient substance to warrant investigation.

Comment by Complainant:

The discussion above is utterly irrelevant. The values of the estimates in the table in question were submitted by members of the Plume Team. The members were asked to submit an estimate and an uncertainty range. The table shows the uncertainty range, i.e., the estimate minus the uncertainty and the estimate plus the uncertainty. The first three rows show identical estimates with uncertainty ranges of 24,000 to 40,000 bpd, so the estimate was 32,000 bpd +/-8000 bpd. We challenge the panel member to show us anywhere in the Final Report body or appendices that the number 32,000 occurs. It does not.

The estimates were submitted to NIST and Dr. Lehr via email. In the investigation phase, the IRP should ask Dr. Lehr to produce any documentation with an estimate of 32,000 +/- 8000 bpd.

5.1.5 Summary Statement

The available evidence suggests these allegations in total do not have sufficient substance to warrant investigation.

The OSTP Executive Order (Federal Register Vol 65, No. 235 pp 76260-76264) instructs that a finding of misconduct requires that 1) There be a significant departure from accepted practices of the relevant research community; and 2) The misconduct be committed intentionally, or knowingly, or recklessly; and 3) The allegation be proven by a preponderance of evidence.

Comment by Complainant:

The available evidence obviously suggests that an investigation is in order. The various excuses and explanations offered by the panel member should be addressed in an investigation, not the inquiry phase.

5.2 Recommendation of Integrity Review Panelist James Hoke

I have studied the four allegations by the Complainant, as well as the relevant documentation available to the NOAA Integrity Review Panel at this time. The available evidence suggests none of these allegations has sufficient substance to warrant investigation.

Before reviewing the individual allegations, I would like to discuss a number of points that are fundamental to my findings and recommendation on this matter.

5.2.1 Fundamental Principles

Standard for judging misconduct. As described in the introduction above, the standard used by the panel in judging misconduct regards fabrication of results, plagiarism, and clear misstatement of facts.

Standard of proof. The standard I used in this inquiry was "preponderance of the evidence" and not "beyond reasonable doubt." This is the standard set forth in "Federal Policy on Research Misconduct," 65 Fed. Reg. 76262.

Emergency situation. Deepwater Horizon failed catastrophically on April 20, 2010, and the Macondo well was capped on July 15, 2010. The Final Report of the Plume Team was issued just six days later. Thus, the vast majority of the work leading to the Final Report was conducted during extreme emergency conditions requiring rapid responses to questions and other requests with short deadlines and necessitating critical decisions without the luxury of a great amount of time. The foremost role of the Plume Team was to advise the National Incident Command and not to conduct a thorough scientific investigation.

Particle Image Velocimetry (PIV). In general, PIV is a technique for determining fluid flow based on the analysis of sequential video images. There appeared to be two very different definitions of PIV, however, used in the evidence. In one definition, PIV was used generically to refer to both automated and manual techniques. (An example of a manual technique is Feature Tracking Velocimetry – FTV.) Alternately, the term PIV was used to refer specifically to the automated techniques only and not the manual techniques. Thus, one definition was a subset of the other. The Plume Team used PIV in both contexts without always clarifying which definition was being used. As a result, there was a great deal of opportunity for misunderstanding and for confusion among the Plume Team members and others as to the meaning of PIV.

Definition of consensus. In his statement of July 23, 2012, to Dr. Rago, Chair of the Integrity Review Panel, the Respondent outlines the process by which the Plume Team reached consensus on its estimates of flow rate.

> "The team was tasked by the National Incident Command to produce estimates of the flow rate at specific times, often while the members were still trying to process that data. The approach that I and Dr. McNutt adopted to generate these numbers was to call a meeting or teleconference of the flow experts and allow them to reach a consensus estimate that at least a majority of the team could support. I would then draft the language describing their conclusions for release and get approval from the team before submission to the FRTG Head."

A key point is that consensus was defined as the <u>majority</u> for the purposes of the Plume Team. It would have been helpful if the Final Report had explicitly explained that process. Also, in retrospect, removed in time from the stress of the international emergency, one might ask whether it would have been preferable to have used a higher level of agreement.

Final Report Disconnect. The body of the Plume Team's Final Report and the report's appendices do not complement each other. In typical reports, the appendices often provide additional information deemed too detailed for inclusion in the body of the report. In the Plume Team's Final Report, however, there were appendices involving FTV for which there was no

clear connection to the body of the report. This disconnect is explained on page 200 of the Final Report in the following statement attributed to the Respondent.

> "The introductory background material was not intended to be a summary of the individual appendices, but rather to provide a basic explanation of the PIV method and to record the consensus results. This consensus was reached prior to the documenting material in the appendices and changing the section to include them would not accurately represent the process."

5.2.2 Analysis of Allegations

There were four allegations of scientific misconduct presented by the Complainant. The following is my analysis of each.

Allegation 1. *Falsification of Scientific Findings: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, and §7.02, [the Respondent] intentionally falsified the Scientific Product of the Plume Team by naming his Final Report "Deepwater Horizon Release Estimate of Rate by PIV" and by reporting that the majority of the thirteen members of the Plume Team used a technology called Particle Image Velocimetry (PIV) and estimated an oil leak rate of 25,000 to 30,000 bpd. The truth is that only three of the thirteen members of the Plume Team used PIV for their official estimates of the oil leak rate.*

As pointed out in the Fundamental Principles above, the term PIV was used in two contradictory ways by the Plume Team. The resultant confusion between the two definitions in my opinion rendered irrelevant the distinction between the two definitions to decision makers and the public. Also, the evidence indicates the majority of the Plume Team supported PIV as defined in its limited context as specifically an automated technique. Results from FTV (a type of PIV in the broader context) were presented in the appendices of the Final Report. Based on all those considerations, I believe referring to PIV in the title of the Final Report may have been confusing, but it was not deceptive. Also, I did not find evidence in the Final Report or the Final Presentation indicating the Respondent reported the Plume Team "used" PIV. The available evidence suggests this allegation does not have sufficient substance to warrant investigation.

Allegation 2. *Failure to Objectively Consider Conflicting Findings: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, and §7.02, [the Respondent] intentionally omitted any discussion in his Final Report and Final Presentation about the use of a different technology called FTV by three other members of the Plume Team. The accurate estimates by FTV were in the range of 50,000 to 60,000 bpd, but [the Respondent] did not report the estimates to key decision makers or to the public. [The Respondent] failed to "objectively consider conflicting data" and failed to "accurately report results" to key decision makers*.

Conflicting findings were discussed during the deliberations of the Plume Team. The consensus of the Plume Team was presented in the body of the Final Report and in the Final Presentation. Given the definition of consensus used in determining Plume Team conclusions and the process used to reach that consensus discussed in the Fundamental Principles above, it does not seem

unreasonable for the body of the Final Report and the Final Presentation to focus on the consensus results. The Final Report did include appendices providing results from FTV, so the information was available to decision makers and the public who might have wanted to dig into those details. The available evidence suggests this allegation does not have sufficient substance to warrant investigation.

Allegation 3. *Prevention of Conflicting Views from Being Reported to Key Decision Makers: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, §7.02 and NOAA's Code of Ethics for Science Supervision and Management, [the Respondent] prevented members of the Plume Team who used FTV from communicating their findings to key decision makers. On July 30, 2010, [the Respondent] gave the Plume Team's Final Presentation to the team of key decision makers (including DOE Sec. Chu, DOI Sec. Salazar, USGS Dir. McNutt, the Directors of three DOE National Labs, etc.) who were determining the government's final estimate of the oil leak rate. Only the three members of the Plume Team who used PIV and underestimated the oil leak rate were informed of the Final Presentation and allowed to meet with the key decision makers. Members of the Plume Team using FTV were not informed of the Final Presentation. Thus, [the Respondent] prevented the members using FTV from meeting with the key decision making team, and prevented "the timely communication of scientific findings" to key decision makers.*

On June 14, 2010, a member of the Plume Team who was an FTV advocate; Dr. Marcia McNutt, Flow Rate Technical Group (FRTG) lead; and several others met with Department of Energy Secretary Steven Chu and Department of the Interior Secretary Kenneth Salazar. The Respondent was not in attendance. I am aware of no reason why the FTV advocate from the Plume Team would not have had the opportunity at that meeting to communicate his thoughts to the key decision makers present. In addition, I see no reason why the FTV advocate from the Plume Team could not have conveyed his thoughts at any time to Dr. McNutt in her capacity as the lead of the FRTG, which had as a subgroup the Plume Team in which the FTV advocate served.

Contrary to the allegation, the Respondent did not attend the meeting of July 30, 2010. According to the Respondent's written testimony (dated August 14, 2012), the meeting was organized by Sandia National Laboratories staff, who among other things were responsible for establishing the agenda. According to the Respondent, the organizers requested the Plume Team presentation "give the essence of the model or experimental technique." As the Respondent did not have the time to prepare the presentation and was unable to attend, he requested Plume Team members Dr. Steven Wereley and Dr. Alberto Aliseda be responsible for preparing and delivering the presentation, which focused on the consensus results of the Plume Team. (The Respondent provided several slides for the presentation for that meeting.) Given the time constraints on decision makers at that meeting, it seems reasonable the presentation would focus on the consensus results of the Plume Team, that persons supporting the majority opinion of the team would give the presentation, and that attendance at the meeting would be limited to those deemed essential to the decision-making process.

As mentioned in the preceding paragraph, the Respondent provided several slides for the presentation of July 30, 2010. In his statement of July 23, 2012, the Respondent says he

accidentally made a mistake in preparing one of the slides. He said he unintentionally missed the estimates from an FTV advocate and one other Plume Team member, perhaps by the Respondent's use of an old version of a document. Thus, the Respondent's intent was to include FTV results in the Final Presentation, but it did not happen because of the error.

The available evidence suggests this allegation does not have sufficient substance to warrant investigation.

Allegation 4. *Fabrication of Findings and Failure to Provide Traceability of Data: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, and §7.02, [the Respondent] added an additional estimate by PIV from a scientist who was not a member of the Plume Team to his Final Report and Final Presentation. [The Respondent] did not reveal to the Plume Team's members, to peer reviewers, to key decision makers, or to the public that he added an estimate from a scientist who was not a member of the Plume Team. It appears that [the Respondent] also altered the values of the estimates by PIV to make them appear identical and more "consistent."*

On page 11 of the Complainant's allegations, there is reference to a table on page 15 of the Plume Team Final Report. That table is used as the basis for the allegation that the Respondent added an estimate from a scientist not on the Plume Team. That table, however, resides in the Final Report on the first page of Appendix 1: "NIST Statistical Analysis" and therefore was developed by NIST and not by the Respondent.

Comment by Complainant:

The Respondent, Dr. Lehr, allowed Juan del Alamo, who was not a member of the Plume Team, to submit an estimate by PIV. Each team member, on behalf of their organization, was asked by Dr. Lehr to submit one estimate. Those estimates were submitted to Dr. Lehr and NIST. Dr. Lehr allowed UCSD to submit two identical estimates.

Additional detail regarding the essence of the last sentence of Allegation 4 above is found on page 12 of the allegations. The Complainant states "it appears that the actual numerical values of estimates in the table presented [*sic*] by [the Respondent] in his Final Presentation have been changed to make them appear more 'consistent'." That sentence appears to be in error because the results for the first five of the seven experts in the NIST-prepared table on page 15 of the Final Report are identical to those of the five experts in the table in the Final Presentation. (As explained in the preceding paragraph, the results for the sixth and seventh experts were accidentally not included in the table of the Final Presentation.)

Comment by Complainant:

Perhaps the panel member misunderstands the allegation. The allegation is that the numerical values of the estimates in the table cannot be found in the appendices. Our complaint explains what the estimates are in the appendices, and that the identical values in the first three rows cannot be found in the appendices. Someone changed the values of the estimates, and an investigation is required to find out what happened.

The available evidence suggests this allegation does not have sufficient substance to warrant investigation.

Section 5.3 Recommendation of Integrity Review Panelist Marian Westley

I have studied the four allegations by the Complainant, as well as the relevant documentation available to the NOAA Integrity Review Panel at this time. To me, the available evidence suggests that parts of two of these allegations have substance, and therefore I recommend an investigation.

Before reviewing the individual allegations, I would like to discuss a number of points that are fundamental to my position on this matter.

5.3.1 Fundamental Principles

The purpose of the inquiry. As described in the *Procedural Handbook for NOAA Administrative Order (NAO) 202-735D: Scientific Integrity* Section 5.02(a), "The purpose of the inquiry phase is to assess whether a Scientific and Research Misconduct allegation has substance and to determine whether an investigation is warranted."

Standard for making a decision. The Panel agreed to apply the standard described in the Federal Policy on Research Misconduct that was in place at the time of the alleged misconduct (see 65 Fed. Reg. 76262): "Research misconduct is defined as fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results… Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record... Research misconduct does not include honest error or differences of opinion." The standard of proof is "a preponderance of the evidence," not "beyond a reasonable doubt," and I note that in this inquiry phase, we are reviewing the preponderance of the evidence that the allegation has substance and warrants investigation, not necessarily the preponderance of the evidence that scientific misconduct occurred. Applying this standard, my choices for each allegation were: "To me, the available evidence suggests the allegation of misconduct has no substance" or "To me, the available evidence suggests the allegation of misconduct has substance, and therefore I recommend an investigation."

Context. The allegations against the Respondent must be evaluated in the context of the unprecedented nature of the oil spill and the government's response to the spill. According to McNutt *et al.* (2011): "At the time of the *Deepwater Horizon* blowout, there were no proven methods for directly measuring the deep sea discharge of hydrocarbons at the relevant pressures and temperatures." The Flow Rate Technical Group (FRTG) was chartered in May 2010: "Experts from many scientific disciplines were brought together to perform the FRTG's two primary functions: *(i)* as soon as possible, generate a preliminary estimate of the flow rate, and *(ii)* within approximately 2 months, use multiple, peer-reviewed methodologies to generate a final estimate of flow rate and volume of oil released." I note that these two functions are somewhat different: one is primarily an emergency response function and the other is primarily a research function, and modes of behavior that might facilitate the first function (e.g. the use of expert judgment, an emphasis on timeliness over accuracy, and the reliance on established techniques wherever possible), may not be well-suited to the second function. The Plume

Calculation Team was part of the FRTG and shared these two functions. I interpret the interim flow rate statements made by the Plume Calculation Team as the Team's execution of the first function. The last flow rate statement by the Plume Calculation Team was included in a June 15, 2010, press release. I interpret the July 21, 2010, release of the report, *Deepwater Horizon Release Estimate of Rate by PIV* (hereinafter referred to as the *Final Report*), as the Plume Calculation Team's contribution to the second function of the FRTG, which was fulfilled with the March 10, 2011, release of the FRTG's report, *Assessment of Flow Rate Estimates for the Deepwater Horizon /Macondo Well Oil Spill* (hereinafter referred to as the FRTG *Assessment*).

The Plume Calculation Team *Final Report* contains a 12-page main report, with flow rate estimates provided in the Executive Summary and Conclusions sections, and 200 pages of appendices. As my fellow Panelists have noted, there are clear disparities between the material summarized in the main report and the full range of estimates and approaches included in the appendices. The FRTG *Assessment* includes a section on the Plume Calculation Team's work that appears to be based on the material in the Plume Calculation Team main report, and includes the Plume Calculation Team main report as an appendix. Therefore, decisions concerning what material to include and exclude from the Plume Calculation Team main report affected the representation of the Plume Calculation Team's findings in the FRTG *Assessment*.

As oil and gas exploration reaches into ever more extreme and remote environments (e.g. the Arctic continental shelf), NOAA must be ready to respond to environmental emergencies in which standard approaches are likely to prove inadequate and technologies essential to the response and recovery effort may be developed and refined in real time. It is likely that future emergency responders will be faced with the same dual charge that the FRTG faced: to develop meaningful information as quickly as possible while also performing the research necessary to facilitate future emergency response efforts. NOAA and our federal partners will require the ability to enlist expertise from other government agencies and from academia (as was done in this case), to conduct an effective response using blended teams with experts from multiple sectors representing a wide range of experiences, and to understand and communicate uncertainty and minority viewpoints. The work of the FRTG is likely to form a precedent for the government's response to future environmental emergencies, and it is my conviction that NOAA would be well-advised to study the experience of the Plume Calculation Team and learn from the strengths and weaknesses of the processes used by the Team during the Deepwater Horizon/Macondo oil spill.

5.3.2 Analysis of Allegations

There were four allegations of scientific misconduct presented by the Complainant. The following is my analysis of each.

Allegation 1. *Falsification of Scientific Findings: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, and §7.02, [Respondent] intentionally falsified the Scientific Product of the Plume Team by naming his Final Report "Deepwater Horizon Release Estimate of Rate by PIV" and by reporting that the majority of the thirteen members of the Plume Team used a technology called Particle Image Velocimetry (PIV) and estimated an oil leak rate of 25,000 to*

30,000 bpd. The truth is that only three of the thirteen members of the Plume Team used PIV for their official estimates of the oil leak rate.

This allegation results from the disparities between the material summarized in the main body of the Plume Calculation Team *Final Report* and the full range of estimates and approaches included in its appendices. I take the allegation concerning the title of the report seriously for two reasons: 1. naming a report is a very powerful way of communicating the content of a report and 2. the name then propagated into other communications referencing the work of the Plume Calculation Team, such as FRTG *Assessment*, which includes a section named "Video PIV Analysis" and an Appendix named "Plume Calculation Team 2010; Particle Image Velocimetry Report."

There are ten appendices in the Plume Calculation Team *Final Report*, only one of which includes the term PIV in its title, and even in this case, the author is careful to state that his approach "would be more properly classified as correlation-based feature tracking" (*Final Report* p. 57). Of the five appendices dedicated to estimates of the oil flow rate made by analyzing video of the plume, three include lengthy documentation of the failure of Particle Image Velocimetry when applied to analysis of the Deepwater Horizon oil leak and instead provide estimates using alternative approaches. Thus the title *Deepwater Horizon Release Estimate of Rate by PIV,* does not seem appropriate to the work of the Plume Calculation Team.

In his testimony to the Panel, the Respondent justifies the use of the term PIV in the title by quoting from an email by team member Franklin Shaffer: "I agree that the various "PIV" techniques we are using are not strictly what engineers would call PIV. But given that the audience will be the general public, I think calling this "PIV" is close enough."

Comment by Complainant.

Dr. Lehr knows that this quote and the discussion surrounding it had nothing to do with what to call the manual feature tracking technique. The panel should take this as another example of Dr. Lehr trying to obscure the research record. Allow us to explain the facts:

In May, when the Plume Team started its work, ALL of the members of the Plume Team tried to use automatic PIV to measure the velocities of the oil leak jets. No one was using manual feature tracking or discussing on May 26, 2010, and Dr. Lehr knows that. Only after trying PIV for a couple weeks, in the second week of June 2010, did several team members conclude that PIV was inappropriate for this application and switch to a different technique, manual feature tracking.

The topic of the discussion of May 26, 2010, from which a quote from Mr. Shaffer is shown, was that PIV is a very specific laboratory technique in which velocity fields of a transparent fluid are measured by recording the motion of small seed (added by the user) particles that are being illuminated with a carefully controlled sheet of laser light that is perpendicular to the camera. Dr. Savas's concern was that we were calling the technique PIV, but the fluid (oil leak) was not transparent, we were not adding seed particles, we were not illuminating with a sheet of laser light, and the camera's line-of-view was not normal to the laser sheet.

The discussion surrounding Shaffer's quote had nothing to do with manual feature tracking. He was not saying that the term PIV could be used for both the automatic PIV

technique and manual feature tracking. He was simply saying that the general public would not distinguish so much detail about the PIV technique.

No one on the Plume Team proposed using the term PIV to describe both the automatic PIV technique and the manual feature tracking technique. The members of the Plume Team, including Dr. Lehr, know that they are two distinctly different techniques.

I find this defense unsatisfactory since the email was sent on May 26, 2010, and cannot therefore refer to a draft of the *Final Report* (which was submitted for review in late June). Furthermore, the email was included in a chain of emails in which several other members of the Plume Calculation Team appear to express reservations about the term PIV, including this statement from team member Alberto Aliseda: "I think we should clarify that we are not doing PlV, but rather using PlV algorithms to obtain velocity measurements from the features on the surface of the jet" (see email from Steven T. Wereley to Alberto Aliseda and others, "RE: draft report - two notes from Omer", sent on 26 May, 2010.)

Comment by Complainant:

We agree. The topic of the discussion was that they were not applying PIV in the traditional way PIV is applied. This discussion had absolutely nothing to do with manual feature tracking. The members of the Plume Team are experts in PIV. They know what it is, and they know it is distinctly different from manual feature tracking by hand. Again, Dr. Lehr is trying to confuse the readers to obscure the research record.

The Plume Calculation Team Scientific Product associated with the time period of the cited email did not include the term PIV in its title (see *Estimated Leak Rates and Lost Oil from the Deepwater Horizon Spill, May 27, 2010, Interim Report to the Flow Rate Technical Group*). Therefore, I find the use of the term PIV in the title of the final report to be inaccurate, and I find it difficult to believe that the Plume Calculation Team agreed to this wording. Further investigation would be necessary to determine if including the term PIV in the title of the Plume Calculation Team final report constituted scientific misconduct by the Respondent.

The Complainant further alleges that the Respondent intentionally falsified the Scientific Product of the Plume Calculation Team "by reporting that the majority of the thirteen members of the Plume Calculation Team used a technology called Particle Image Velocimetry (PIV) and estimated an oil leak rate of 25,000 to 30,000 bpd." In my view, this part of the allegation does not warrant investigation under the standards that we are using since PIV is referred to in the report as "the main method used," a statement that contains no information on the number of people who used the method, and the diligent reader can trace the 25,000 to 30,000 bpd leak rate estimate to a June 10, 2010, press release from the National Incident Command.

Comment by Complainant:

The issue is that Dr. Lehr shows a list of thirteen members of the Plume Team. Then he states that the main method used was PIV (he does not define what he means by "the main method") and that most of the experts (he does not define what "most" means) produced estimates that were as high as 50,000 bpd. He never discloses that only three members used PIV. This leads the reader or audience to believe that most of the 13 experts produced estimates with PIV that were as high as 50,000 bpd. Dr. Lehr could

have easily stated how many members used PIV, and how many used manual feature tracking. He chose not to.

In summary, for the part of Allegation 1 that refers to the title of the Final Report, the evidence suggests to me that the allegation has substance and therefore I recommend an investigation.

Allegation 2. *Failure to Objectively Consider Conflicting Findings: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, and §7.02,[Respondent] intentionally omitted any discussion in his Final Report and Final Presentation about the use of a different technology called FTV by three other members of the Plume Team. The accurate estimates by FTV were in the range of 50,000 to 60,000 bpd, but [Respondent] did not report the estimates to key decision makers or to the public. [Respondent] failed to "objectively consider conflicting data" and failed to "accurately report results" to key decision makers*.

Falsification includes "changing or omitting data or results such that the research is not accurately represented in the research record" (see OSTP Policy of Research Misconduct, 65 Fed. Reg. 76262). A major finding after the Deepwater Horizon oil spill was that "The method of automated PIV, used by several groups of experts during the spill to analyze video segments, was inappropriate for the application and resulted in oil flow rates that were biased too low by a factor of two" (McNutt *et al.* 2011). Much of the information needed to reach this finding was available in the Appendices of the Plume Calculation Team *Final Report*. In a report dated June 15, 2010, and included in Appendix 4 of the Plume Calculation Team *Final Report*, Ömer Savaş wrote: "During the teleconference on June 10, 2010, it was clear that I must provide details for my concerns and bases for my opinions." His report described in detail the limitations of PIV as applied to the oil spill (see page 47 of the *Final Report*). His statement provides evidence that the team was discussing concerns with the PIV approach during team meetings as early as June 10, 2010. While the body of the Plume Calculation Team *Final Report* lists some of the issues with PIV analysis that could apply to any video analysis of the plume (the flow was not spatially or temporally uniform, the ratio of oil to gas in the plume was not known with certainty, some of the video was of excessively poor quality), there is no indication that three of the "PIV experts" had tried PIV, realized that its shortcomings were insurmountable, and developed alternative approaches. I regard the failure to fully represent the findings of the team to be a major defect in the Plume Calculation Team *Final Report*.

The flow rate estimates provided in the main body of the Plume Calculation Team *Final Report* do not encompass the full range of values provided by the Plume Calculation Team. The Conclusions section of the *Final Report* states that for the video provided after the riser was cut, "The best estimate of the PIV experts was for a flow of 35,000 to 45,000 bbl with the possibility that the leak could be as high as 50,000 bbl day." This range does not capture the flow rate estimates provided in two Appendices: 62,500-68,000 bbl/day (with uncertainties larger than ± 50%) in Appendix 6 and 61,000 bbl/day ± 15,000 bbl/day in Appendix 7. It is not clear how the estimate cited in the Conclusions of the *Final Report* was developed or when. While the full range of values is available to diligent readers in the Appendices to the Plume Calculation Team *Final Report*, it is the estimates provided in the main body of the Plume Calculation Team *Final Report* that appear in the March 10, 2011, report of the full FRTG as part of the heading on the Plume Calculation Team's work: "Video PIV Analysis (Plume Calculation Team 2010,

Appendix D): 25,000 to 30,000 BPD (pre-riser cut), 35,000 to 50,000 BPD (post-riser cut)" (see page 11 of the FRTG *Assessment*). Appendix D of the FRTG *Assesssment* is the Plume Calculation Team *Final Report* minus appendices, which are mentioned in this note on page 21 of the FRTG *Assessment*: "Due to the length of the full Plume Calculation Team report, this appendix includes only the summary section. The full report can be downloaded at: http://www.usgs.gov/oilspill/ and http://www.doi.gov/deepwaterhorizon/index.cfm." In other words, a reader who begins by reading the FRTG *Assessment* would have to be diligent indeed to find the full range of estimates provided by the Plume Calculation Team since they are not included in the "summary section."

Reviewer 5 of the Plume Calculation Team *Final Report* called attention to the report's opacity: "I found the report itself to be very weak. Basically, it relies on the reader to sort through all of the appendices to understand the numbers presented. Specifically, it is not clear where the numbers presented in the Executive summary and in the body of the report come from nor what they mean…Had the report presented a coherent summary of the work presented in the appendices it would have been a lot easier to read and more believable." (See page 193 of the *Final Report*).Reviewer 2 provided several concrete suggestions for improving the final report, concluding, "I would like each set of results presented in one final table in the Overview" (see page 180 of the Final Report).

Rather than accept this constructive criticism and edit the report, the Respondent replied that he took "exception to some comments by reviewers 2 and 5. The introductory background material was… [intended to] record the consensus results. This consensus was reached prior to the documenting material in the appendices and changing the section to include them would not accurately represent the process" (see page 200 of the Plume Calculation Team's Final Report). While respect for team process is laudable, the reader is still left with no understanding of what that process entailed. Was the "best estimate" a consensus statement, and if so, what was the definition of consensus and how were views that fell outside of the consensus represented in the report? At what point in time was each consensus reached, considering that team members were changing their estimates not only as new video became available to them, but also as they reached new understanding of the strengths and weaknesses of the methods they were applying to their analyses? Because the Respondent received clear feedback from two reviewers concerning the weakness in the report, and because the Respondent had time to respond to these reviewers, I am left with the impression that the Respondent chose to leave the report in its current, confusing state in order to marginalize the contributions of certain team members and to hamper the communication of higher flow rate estimates to key decision makers and to the public.

In support of this allegation, the Complainant provides a copy of the slides prepared for a presentation of the Plume Calculation Team's findings given to Secretaries Chu and Salazar on July 30, 2010. The first slide lists the Respondent as the first author, with two other members of the Plume Calculation Team also listed as authors. The presentation contains a single results slide in which the results from the authors of Appendices 6 and 7 are missing. The Respondent has explained to the Panel that he was not present at the July 30, 2010, meeting and that the presentation was given by two other members of the Plume Calculation Team. He admits that he

prepared the results slide and asserts that the omissions were unintentional, perhaps the result of working under excessive time pressure.

Comment by Complainant:

The conclusion that Dr. Lehr accidentally omitted the two highest estimates from this table is a finding of fact and is not within the scope of the inquiry phase. The inquiry phase is to determine of allegations have substance, *i.e.*, that they are not frivolous. This allegation has been shown to have substance. The allegation that Dr. Lehr omitted the two highest estimates is accurate. An investigation is needed to determine if the omission was an accident.

The FRTG and its Plume Team were created because the public, the press, and many in Congress believed that the government and BP were intentionally underestimating the oil leak rate. The FRTG was created to generate accurate estimates to restore the faith of the public and to guide the response efforts. The Deepwater Horizon oil leak was perhaps the worst environmental event in the history of the U.S. The work of the Plume Team was under intense scrutiny by the press.

The July 30, 2010, presentation was to the highest level of decision makers: the Secretaries of Energy and Interior, the Director of the USGS, the Directors of three National Labs. Furthermore, there were two other authors of this presentation. So, all three authors would have had to make a cut-and-paste mistake. In this context, to conclude that a senior PhD level scientist would accidentally omit the highest estimates is not credible.

Furthermore, there is evidence in the paragraph above the table that shows the omission was intentional. In the paragraph above the table, key decision makers are told that the highest estimates of the Plume Team were 50,000 bpd. If the statement above the table would have said the highest estimates were higher than 60,000, we might accept the excuse that it was an accident. However, the statement is consistent with the intent to not disclose the two highest estimates to key decision makers.

Since scientific misconduct implies knowing and willful falsification of results and not genuine error, I do not believe that the flawed results slide is evidence of scientific misconduct.

In summary, for the part of Allegation 2 that refers to the Plume Calculation team *Final Report*, the available evidence suggests to me that the allegation has substance and therefore I recommend an investigation.

Allegation 3. *Prevention of Conflicting Views from Being Reported to Key Decision Makers: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, §7.02 and NOAA's Code of Ethics for Science Supervision and Management,[Respondent] prevented members of the Plume Team who used FTV from communicating their findings to key decision makers. On July 30, 2010, [Respondent] gave the Plume Team's Final Presentation to the team of key decision makers (including DOE Sec. Chu, DOI Sec. Salazar, USGS Dir. McNutt, the Directors of three DOE National Labs, etc.) who were determining the government's final estimate of the oil leak rate. Only the three members of the Plume Team who used PIV and underestimated the oil leak rate were informed of the Final Presentation and allowed to meet with the key decision makers. Members of the Plume Team using FTV were not informed of the Final Presentation. Thus,*

[Respondent] prevented the members using FTV from meeting with the key decision making team, and prevented "the timely communication of scientific findings" to key decision makers.

This allegation and the supporting documentation focus on two issues: the first is attendance at a July 30, 2010, meeting with Secretaries Chu and Salazar. The second is alleged efforts by the Respondent "to discredit and remove members from the Plume Calculation Team who reported that PIV was making mistakes and underestimating the leak rate."

According to the Respondent, the July 30, 2010, meeting was organized by the Department of Energy, and the Respondent was not at liberty to invite additional members of his team. While I feel it is unfortunate that the full Plume Calculation Team was not informed of the existence of the meeting and the process by which the Respondent chose those individuals who would represent the Plume Calculation Team at the meeting, I do not believe that this constitutes scientific misconduct.

Comment by Complainant:

An investigation is required before such a finding of fact can be made. The inquiry phase is simply to determine if an allegation has substance. It is true that Dr. Lehr did not let members of the team who used FTV and disagreed with PIV present their findings to key decision makers on July 30, 2010. Therefore this allegation has substance and should be referred to the DO for investigation.

Dr. Lehr chose the members of the Plume Team who would give the Final Presentation. He only chose two members who used PIV for their estimates. This shows a pattern of not disclosing the highest estimates to key decision makers. Not disclosing the highest estimates is certainly scientific misconduct, especially for a scientific team that was created to avoid the appearance of government intentionally underestimating the oil leak.

If the Final Presentation had disclosed that a second technology different than PIV was used, and that several members abandoned PIV after concluding it was underestimating the oil leak rate, we might accept that this was not scientific misconduct. The Final Presentation did not make that important disclosure. Thus, this allegation on its face describes scientific misconduct.

To support Allegation 3, the Complainant argues that the Respondent tried "to discredit and remove members from the Plume Calculation Team who reported that PIV was making mistakes and underestimating the leak rate" and provides, as corroborating evidence, an email conversation showing that Dr. Marcia McNutt, the leader of the FRTG, encouraged Mr. Shaffer to resign from the team on June 8, 2010. The Respondent has provided the Panel with further evidence of Dr. McNutt's desire to remove Mr. Shaffer from the team. While there is ample evidence of discord in the Plume Calculation Team, and perhaps much could be learned from the Team's dynamics about leadership during crisis, I note that Dr. McNutt is not the subject of this inquiry.

In summary, absent clear indication that the Respondent actively tried to remove members of the Plume Calculation Team who were reporting that PIV was underestimating the flow rate, the available evidence suggests to me that Allegation 3 has no substance and does not require further investigation.

Allegation 4. *Fabrication of Findings and Failure to Provide Traceability of Data: In violation of NAO 202-735D, §6.01(a), §6.01(b), §6.01(c), §7.01, §7.02, [Respondent] added an additional estimate by PIV from a scientist who was not a member of the Plume Team to his Final Report and Final Presentation. [Respondent] did not reveal to the Plume Team's members, to peer reviewers, to key decision makers, or to the public that he added an estimate from a scientist who was not a member of the Plume Team. It appears that [Respondent] also altered the values of the estimates by PIV to make them appear identical and more "consistent."*

The basis of this allegation is the Table of estimates shown in Appendix 1 of the Plume Calculation Team *Final Report* (see page 15). This appendix was written by statisticians from the National Institute of Standards and Technology (NIST), not by the Respondent, and was based on estimates provided to the statisticians by members of the Plume Calculation Team.

Comment by Complainant:

The members of the Plume Team submitted their estimates to both NIST and the team leader, Dr. Lehr.

The confusion as to the identity of the experts appears to derive from the fact that four members of the Plume Calculation Team – Alberto Aliseda, Oscar Flores, Juan Lasheras and James Riley – co-wrote a single Appendix report. However, as Plume Calculation Team members and flow rate experts, they were entitled to provide independent estimates of the flow rate to the statisticians. An earlier report by the NIST statisticians listed the following experts by name: Alberto, Ira, Jim, Juan, Omer and Steve. (This report, *Pooling Expert Assessments: June 8 2010,* by Antonio Possolo and Pedro Espina is available as an attachment to an email from Matt Lee-Ashley to Marcia McNutt and others, with the subject: "FOR IMMEDIATE REVIEW - close hold - draft release on updated Plume Team estimates" sent on June 8, 2010.) The estimates of Alberto, Jim and Juan were indentical on June 8, 2010, which leads me to surmise that experts A, B and C in the *Final Report* are the same three people.

Comment by Complainant:

Experts A, B, and C are NOT Alberto, Jim, and Juan. The estimates in the first three rows (experts A-C), we have evidence to show, are from Juan C. Lasheras (UCSD), Juan C. del Álamo (UCSD), and Alberto Aliseda (Univ. Washington). Jim Reilly stopped submitting estimates after the June 14, 2010, meeting. All of this can be confirmed in the investigative phase by asking Dr. Lehr, NIST, Lasheras, del Álamo, and Alberto Aliseda.

An essential point of this allegation is that the values of the estimates of Experts A, B, and C (Aliseda, Lasherus and del Alamo) are not the same as the estimates reported by Experts A, B, and C in the appendices of the Final Report. Someone changed the values to make them identical in the NIST table, Final Report body, and Final Presentation. . An investigation is required to determine who changed the values of Experts A,B, and C and why.

Another essential point is that Juan C. del Álamo was not a member of the Plume Team. UCSD is the only organization that was allowed to submit two estimates. All of the other organizations were allowed to submit only one estimate, even though their appendices had several authors, many of whom used different techniques (*e.g.*, Lagrangian jet theory, CFD, etc.) and produced estimates. Why was UCSD the only organization allowed to submit two estimates? Could it be that Dr. Lehr looked at the six estimates from the members of the Plume Team and realized that only three experts used PIV, so

the majority of experts did not use PIV? Did he ask UCSD to submit an additional estimate so he could claim the majority of estimates were from PIV? An investigation is needed to determine what really happened. In the investigative phase the panel has expanded powers to collect additional evidence. In that phase, we suggest that you ask Dr. Lehr and NIST to reveal to you the identity of the experts in this table.

Clearly, this allegation has substance, it is not frivolous. We ask that you reconsider.

Conclusion

As noted in the IRP draft, this is the first scientific misconduct complaint handled under the new NOAA process. This process was created by a March 9, 2009 Directive from President Obama in which he directed that:

> "The public must be able to trust the science and scientific process informing public policy decisions. Political officials should not suppress or alter scientific or technological findings and conclusions."

As this is the first application of these principles by NOAA, it is important that it be done in a manner beyond reproach, erring on the side of transparency and ensuring credibility to the public. For the reasons stated above, this draft falls well short of those standards.

We strongly urge that this draft be taken back to the drawing board. By the plain reading of the NOAA rules, this complaint deserves an actual investigation.

Sincerely,

Jeff Ruch
Executive Director