



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
WASHINGTON, D.C. 20460

OFFICE OF THE ADMINISTRATOR  
SCIENCE ADVISORY BOARD

March 20, 2006

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The Honorable Stephen L. Johnson  
Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

Subject: EPA Science Advisory Board's Homeland Security Advisory Committee Consultation  
on the WaterSentinel Program and Standard Analytical Methods

Dear Administrator Johnson:

On January 30 and 31, 2006, the Homeland Security Advisory Committee of the Science Advisory Board held its second meeting for the purpose of providing initial thoughts on the Agency's WaterSentinel Program and Standard Analytical Methods. This is a brief report on our activities.

The Committee is a remarkably diverse and accomplished group of experts. Their willingness to serve and the intensity of their involvement is a tribute to the Agency and the importance of the missions that it has undertaken for our national security. The committee includes natural, social, and engineering scientists; basic researchers, applied researchers, and practitioners; and representatives of the public and private sector. Indeed, many have served in multiple roles during their careers. I am honored to be their Chair.

Our first meeting, in July 2005, was devoted to a general introduction to the program. At the second meeting, we responded to requests for consultations from the EPA offices that manage the WaterSentinel and Standard Analytical Methods programs. The former was conducted in closed session, while the latter was open to the public. Because similar themes arose in both discussions, this letter conveys the Committee Chair's observation in a non-confidential form.

The Committee was impressed by the hard, thoughtful work done by EPA's staff, working on challenging problems, under time pressure. We were grateful that they had sought us out at a formative stage in their work and actively engaged us in discussing possible future directions. A number of committee members described it as one of the better meetings that they had attended. We hope that the staff felt the same.

Both programs had done good jobs of giving form to some central aspects of their respective tasks. The work was clear enough that committee members were able to identify many of its limitations (often raising comments that had arisen previously among the staff).

The following are some themes from our discussion. As mentioned, the meeting was a consultation, not a review. No formal recommendations were made. As a result, this is informal feedback, based on my general observations, reviewed after informal consultation with committee members. Many comments on specific issues were conveyed during the meeting and, subsequently, through the SAB Designated Federal Officer (DFO).

The Committee was not asked to comment on the overall strategy, in terms of choice of approaches (e.g., WaterSentinel) and allocation of resources to them. Hence, it only considered issues of validity, completeness, integration, and cost-effectiveness.

Systems integration. Staff clearly conceptualized their work in systems terms, including a formal model for some aspects of WaterSentinel, with placeholders for some currently missing functions. It is important that this integration be seen through to its fruition, allowing at least rough estimates of the likely efficacy and cost effectiveness of alternative system designs. It will be particularly challenging to treat behavioral aspects of system performance realistically (e.g., how well equipment will be maintained and operated, how clearly and efficiently test results will be communicated).

Sustainability. Homeland security activities come on top of water managers' heavy routine responsibilities, with few additional resources. It is important to have an implementation plan that ensures that programs like WaterSentinel are mastered and maintained. To that end, an all-hazards strategy is, arguably, essential. If, homeland security activities include functions that are an integral part of routine operations, there may be unrealistic expectations for a generally dormant system to spring into action, in a crisis.

Decision making. It is not clear how the information produced by these technologies will be used. Various institutions and individuals need specific information about the present and future quality of water, in order to make effective decisions. Both analytical and empirical research is needed to identify their information needs, ensure that the system addresses them, and communicates with them effectively. Those needs assessments were not obvious in the system design. On the other hand, there is an opportunity for properly designed and tested communications to increase users' trust and public resilience.

Transition. Agency staff has consulted with many parties during the development process, creating a general understanding of potential users' circumstances. However, there do not seem to be formal analyses for the operational implications of system rollout (e.g., capital costs, training, maintenance). As a result, it is unclear what performance can be expected in real-world circumstances. Those plans could also help protect the Agency from ending up with long-term operational responsibility for the systems that it is developing. That could only be justified, as part of its science budget, if we could assume that no new technologies will be developed and no new threats will arise. Otherwise, the Agency's science should be forward looking.

In summary, we believe the Agency's devoted staff has made great progress toward implementing a research strategy that is weighted toward threat-based technological solutions. In that regard, it resembles efforts elsewhere in the federal government. Gen. Larry Welch, Chair of the Department of Homeland Security (DHS) Technology Advisory Committee underscored the need for a national strategy for public preparedness at the November 2005 meeting. An excerpt from the

transcript of that meeting is attached to this letter. It captures our own beliefs about the challenges facing us and directions that the Agency should pursue.

Thank you for your attention and the opportunity to serve the Agency and its mission.

Sincerely,

/signed/

Dr. Granger Morgan, Chair  
Science Advisory Board

/signed/

Dr. Baruch Fischhoff, Chair  
Science Advisory Board  
Homeland Security Advisory Committee

Attachment

**U.S. Environmental Protection Agency  
Science Advisory Board  
Homeland Security Advisory Committee WaterSentinel Program and Standard  
Analytical Methods Consultative Panel**

**CHAIR**

**Dr. Baruch Fischhoff**, Carnegie Mellon University, Pittsburgh, PA

**MEMBERS**

**Dr. Vicki Bier**, University of Wisconsin, Madison, WI

**Dr. Mark Borchardt**, Marshfield Clinic Research Foundation, Marshfield, WI

**Dr. Mary Durfee**, Michigan Technological University, Houghton, MI

**Dr. David S. Ensor**, RTI International, Research Triangle Park, NC

**Dr. Lynda Knobeloch**, Wisconsin Department of Health & Family Services, Madison, WI

**Dr. Paul J. Liroy**, UMDNJ - Robert Wood Johnson Medical School, Piscataway, NJ

**Dr. Lee D. McMullen**, Des Moines Water Works, Des Moines, IA

**Dr. Christine Owen**, Tampa Bay Water, Clearwater, FL

**Dr. Robert E. Pitt**, University of Alabama, Tuscaloosa, AL

**Dr. Robert Snyder**, Rutgers University, Piscataway, NJ

**Dr. Linda Stetzenbach**, University of Nevada, Las Vegas, NV

**Dr. Richard C. Sustich**, University of Illinois at Urbana-Champaign, Urbana, IL

**Dr. Michael Trehy**, US Food and Drug Administration, St. Louis, MO

**Dr. Daniel C. Walsh**, Columbia University, Long Island City, NY

**Dr. James E. Watson**, University of North Carolina, Chapel Hill, NC

**Dr. Rae Zimmerman**, New York University, New York, NY

**SCIENCE ADVISORY BOARD STAFF**

**Ms. Vivian Turner**, Designated Federal Officer, U.S. Environmental Protection Agency, Washington, DC

## Attachment

On November 8, 2005, the Department of Homeland Security (DHS) held a meeting of the Homeland Security Science and Technology Advisory Committee (HSSTAC). In an open session, the Chair, General Larry Welch, expressed the need for a national strategy for public preparedness. The following is an excerpted transcript of that session. Information on this meeting and the transcript can be found at the following DHS sites:

[http://www.dhs.gov/dhspublic/interapp/editorial/editorial\\_0427.xml](http://www.dhs.gov/dhspublic/interapp/editorial/editorial_0427.xml) and  
[www.dhs.gov/dhspublic/interweb/assetlibrary/Minutes\\_Nov\\_8\\_05.pdf](http://www.dhs.gov/dhspublic/interweb/assetlibrary/Minutes_Nov_8_05.pdf).

### **Open Session (excerpt)**

GENERAL WELCH: Welcome to the open session of our fourth plenary of the year. I will take a few minutes to explain what we are about and what we have done in 2005. The main purpose of this session is to relate the area and kinds of recommendations we will be making to the Department...

There are three principal areas of focus that will characterize this year's recommendations. They are: (1) strategic goals and output-oriented objectives, (2) public interface and public resilience, and (3) the transition of S&T output to operating agencies...

The first area is to examine DHS strategic goals... A recurring theme, again one repeated from last year, which still requires work is expanding a "threat-based" analysis to a "risk-based" or "vulnerability-based" analysis. The difficulty with using only "threat-based" analysis is you will almost always be wrong. We are simply not good at predicting where the next threat will actually be or what the consequences will be...

Turning to public interface and public resilience, we think it is enormously important because it is naive to think that you will prevent all damage or you will prevent all of the incidents that one seeks to prevent. While we would certainly give prevention a very high priority, the fact is that if the overall strategic objective is to preserve the American way of life (that is, to ensure that no set of threats can fundamentally change the U.S. as we know it), then you need a very resilient public. We need a public that can react to a wide range of things that can happen, much of which we will never predict in advance, and to sustain that which we all believe in.

We give a very high importance to preparedness, realistic expectations and public understanding that lead to confidence. We will have some things to say about the responsibility to ensure that expectations are realistic. We will recommend that there be a major thrust to make DHS the "trusted source" for information in emergencies. That does not mean that all the expertise will come from DHS, but the public needs to know in an emergency that there's one communication channel that they can use to get the information and help they require. It needs to be a consistent source; it needs to be trustworthy.