



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

AUG 3 2007

THE ADMINISTRATOR

Dr. Michael J. McFarland  
Chair, Environmental Engineering Committee  
Science Advisory Board  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, N.W.  
Washington, D.C. 20004

Dear Dr. McFarland:

I thank you, the members of the Science Advisory Board Environmental Engineering Committee, and the other SAB contributors to the report titled *Science Advisory Board Advisory on the Office of Research and Development's Sustainability Research Strategy and the Science and Technology for Sustainability Multi-year Plan* (EPA-SAB-07-007). EPA is always grateful to have critical and thoughtful outside guidance on how best to meet its mission responsibilities.

We have revised the ORD Sustainability Research Strategy and the accompanying Science and Technology for Sustainability Multi-year Plan to reflect the SAB's observations and recommendations. ORD's Board of Scientific Counselors is also reviewing the Multi-year Plan, and the BOSC team's recommendations will be reflected in the final Plan as well.

Your endorsement of ORD's new sustainability research program is welcome and timely. As your review notes, the Presidential Executive Order of January 24, 2007, *Strengthening Federal Environmental, Energy, and Transportation Management*, not only defines sustainability but directs agency heads to "implement sustainable practices." Research is required to improve both our understanding of sustainability and the possible paths to get there.

Thank you again for the SAB's advice on the strategic research directions for the sustainability component of EPA's research program. We highly value your input and expertise. More detailed responses prepared by the Agency to the Board's findings and recommendations are enclosed with this letter. We look forward to continued discussions with the SAB on EPA's sustainability priorities and strategic directions.

Sincerely,

Stephen L. Johnson

Michael -  
Thatcher  
Enclosure  
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**Response to the Science Advisory Board's  
*Advisory on the Office of Research and Development's Sustainability Research Strategy  
and the Science and Technology for Sustainability Multi-year Plan (EPA-SAB-07-007)***

The U.S. Environmental Protection Agency appreciates the critical and thoughtful guidance on meeting its mission responsibilities provided in the Science Advisory Board's report, *Advisory on the Office of Research and Development's Sustainability Research Strategy and the Science and Technology for Sustainability Multi-year Plan (EPA-SAB-07-007)*.

We are pleased by the SAB endorsement of the efforts of EPA's Office of Research and Development to establish a sustainability research program. This program aims to improve understanding of the earth's natural and man-made systems, assess threats to those systems, design and apply innovative and cost-effective industrial practices, and develop and apply new technologies and decision support tools. We concur with the SAB's comment that full implementation of the sustainability research strategy will generate vital scientific and technical information that will enable Agency decision makers to better address both present and emerging environmental issues.

***Overall Guidance***

In its report, the SAB recognizes that the Agency is poised to assume a global leadership role in sustainability research and strongly recommends that it immediately undertake two parallel activities: (1) conduct core research on sustainability focused on developing rigorous sustainability metrics, and (2) implement a small number of Agency-sponsored technology demonstration projects that provide ORD with the opportunity to achieve significant visibility within the sustainability research arena. It is important that these demonstration projects move away from end-of-pipe approaches to take a broader, system-based perspective. Such projects might include studies of (1) topical biofuels policies and options, possibly encompassing issues ranging from agricultural expansion to potential impacts of greenhouse gas; (2) the hypoxic environment in the Gulf of Mexico or the Chesapeake Bay, and (3) wastewater practices and infrastructure needs in regions and cities with accelerated population growth.

ORD recognizes the value of this recommendation for sustainability metrics and demonstration projects. Making sustainability projects as concrete as possible with measurable outcomes is necessary for meeting management and accountability objectives. As the value of the ORD sustainability program becomes recognized, other program directors and offices will become more engaged with its attributes, goals, and metrics, and will become active in seeking out collaborative projects.

***Sustainability Metrics***

The development of sustainability indicators is a frontier research area in which new measures of the health of environmental systems are being defined. Effective indicators are able to capture system dynamics that depend on system understanding. ORD's Sustainability Research Strategy and the Science and Technology for Sustainability Multi-year Plan identify research on sustainability indicators as an important new ORD research direction. Such

proposed research complements ongoing EPA efforts related to the Report on the Environment and to developing new indicators that can more explicitly measure sustainable outcomes.

As noted in the Fiscal Year 2008 budget, “EPA’s Sustainability research program will embark on a new effort that is aimed at creating a suite of science-based sustainability metrics that are readily understood by the public.” Building on a body of existing research, ORD has launched a pilot project to explore exactly how such measures can be defined and used in a real and practical manner. A pilot project in partnership with EPA’s Region 8 in San Luis, Colorado, is focusing research on applying and testing the use of four existing sustainability indices to support environmental management decisions. This pilot project will test the application and use of the indices to assess effectiveness of past management actions and provide guidance on needed future actions.

### ***Sustainable Production of Biofuels***

EPA’s Administrator has asked Dr. George Gray, who serves as the EPA Science Advisor and as Assistant Administrator for Research and Development, to represent EPA on the Congressionally mandated interagency Biomass Research and Development Board. Dr. Gray’s participation on this Board will ensure that EPA’s research is well-focused and that EPA is effectively engaged in the federal dialogue on biofuels. He will work across EPA to define and coordinate the systems research and technology solutions needed to identify and pursue the best path toward meeting the President’s energy goals. Our hope is that the lessons learned from the biofuels effort will help refine EPA’s understanding of sustainability principles and how these principles can become operational in our programs.

The SAB recommended that EPA engage in targeted collaboration with other agencies. The biofuels project, which couples high-level interagency engagement with prioritized research, illustrates a component of our approach, and we are also participating in broader interagency dialogues. EPA is working with the Roundtable on Science and Technology for Sustainability of the National Academies on a proposal now under interagency review to create a forum to identify sustainability research gaps among the federal agencies.

### ***Life Cycle and Systems Research***

The SAB report applauds the Agency’s steady movement toward a systems approach that reflects the complexity of the world in which we live and effectively balances environmental protection, economic viability, and societal interests. To ensure a successful Agency transition from the traditional media-specific “stovepipe” approach, ORD aims to pursue a more integrated systems approach to environmental protection. The organization of the Sustainability Research Strategy by multi-media topics will promote greater integration of EPA models and approaches to environmental management.

### ***International Collaboration***

The SAB recognizes that sustainability research is a focus among several countries with the European Union. Recognizing the growing international emphasis on sustainability research

and the importance of international scientific collaboration, EPA's Offices of Research and Development, Environmental Information, and International Affairs initiated and completed negotiations with the EU to build on the sustainability research highlighted in the EU's 7<sup>th</sup> European Research Framework. The Administrator signed the resulting new Implementing Arrangement in February 2007 under the existing US-EU Science and Technology Agreement. EPA is now actively discussing collaboration with the EU on a variety of sustainability-related research and technology topics. A major workshop jointly organized by EPA and the EU will be part of the annual meeting of the American Association for the Advancement of Science in Boston in February 2008.

### ***Workforce Expertise***

The SAB review urges EPA to be "creative and strategic in developing its human resource programs." Having the right skills in EPA's future workforce is high on the Administrator's agenda. This includes developing the current workforce, identifying and recruiting additional experts, and providing opportunities to exchange knowledge and expertise with other organizations. To ensure that we develop the best skill mix, the Administrator has asked Dr. Gray to identify high-priority areas of sustainability expertise for the Administrator's initiative to strengthen the EPA workforce.

ORD's focus on future human resource needs is not new. ORD developed a Strategic Workforce Plan in 2002 that identified sustainability as one of the drivers for near- and long-term issues that ORD researchers must address. Drawing on the Plan's analysis of the expertise that will be needed and the ability of current staff to provide that expertise, ORD – especially its National Risk Management and Research Laboratory – has reoriented staff and recruited post-doctoral scientists to strengthen its ability to address the complex issues associated with sustainability.

To increase the opportunities for beneficial exchange of scientific knowledge, the Administrator has also asked Dr. Gray to identify opportunities for engaging on temporary assignments sustainability experts from academia, other governments (such as EU members), and nonprofit organizations, as well as for sending EPA experts on details to partner organizations. To enhance awareness and understanding of sustainability in our current workforce, ORD and EPA's Office of Policy, Economics, and Innovation in May 2007 hosted at EPA headquarters three days of sustainability training events that participants rated very highly. EPA plans to refine and expand such training efforts to incorporate lessons learned from the sustainability research program.

### ***Future Directions***

The SAB believes that environmental sustainability should become a main thrust of ORD's research program. In response, our Sustainability Research Strategy articulates a new paradigm that will complement risk management efforts. When Administrator Ruckelshaus launched EPA's risk management approach, the new paradigm required considerable time to develop and become part of the Agency's operations. Our sustainability efforts will also take time, but sustainability is the right approach for the problems of today and tomorrow – and it is

the approach that ORD will actively pursue. The Sustainability Research Strategy aims to bring all of EPA's science and policy tools to bear to help decision makers make better decisions. We believe ORD's sustainability research program is important for the next level of environmental protection and is moving EPA's programs from pollution control to pollution prevention to sustainability.

### *Next Steps*

The Sustainability Research Strategy has been significantly revised to reflect major SAB recommendations. In particular, the Strategy now more clearly defines sustainability and more explicitly addresses how this concept relates to EPA's mission and responsibilities and how sustainability activities relate to ORD's current research priorities and organization. The Strategy now better reflects roles of ORD's organization and its National Program Directors. ORD management is currently examining options for increasing integration across existing MYPs, as in the case of energy and biofuels.

The SAB recognizes that EPA has an opportunity to coordinate and lead in the definition of environmental sustainability and in the application of related research products that will influence how other federal agencies and organizations move forward with their sustainability programs. In the months ahead, ORD will publish its Sustainability Research Strategy and begin a year-long outreach effort to work with EPA regional and program offices, other federal agencies, academic institutions, state and local governments, the private sector, environmental groups, and community organizations to define collaborative research efforts that advance sustainability objectives as a basis for environmental management. The Science and Technology for Sustainability Multi-year Plan will also be finalized upon completion of its review by EPA's Board of Scientific Counselors.



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