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

SEP 12 2002

THE ADMINISTRATOR

Dr. William H. Glaze
Dr. Raymond C. Loehr
Science Advisory Board
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Dr. Glaze and Dr. Loehr:

Thank you for your letter and the Science Advisory Board Research Strategies Advisory Committee's review of the science and technology component of EPA's FY 2003 Presidential Budget Request to Congress (EPA-SAB-RSAC-02-007).

I am pleased that the RSAC commended the Agency on its continued progress in identifying major programmatic needs, developing high-quality science personnel, and improving coordination among EPA program offices – all of which contribute to the strengthening of science across the Agency. Please refer to the enclosure for a detailed response to the RSAC's findings and recommendations.

Consistent with the RSAC's FY 2002 recommendation that the Office of Research and Development's FY 2003 budget be increased by 1 percent, EPA's FY 2003 President's Budget Request includes a 5.9 percent increase for ORD. Additionally, of the nine federal agencies with the largest science and technology budgets, EPA's FY 2003 science and technology component reflects the third-highest percentage increase over FY 2002. EPA's continued emphasis on science and technology reflects recognition of the importance of maintaining a strong scientific foundation upon which decisions are made.

In its review, the RSAC identified several research program areas that could be enhanced with additional funding. EPA must prioritize numerous Agency needs when developing its annual budget request. For the science and technology component, we are guided by the Agency's Strategic Plan goals and a risk-based decision-making process. In this way, we can best pursue EPA's mission of protecting human health and the environment.

Again, thank you for the RSAC's comprehensive review. Best wishes.

Sincerely yours,

/ Signed /

Christine Todd Whitman

Enclosure

U.S. Environmental Protection Agency
Responses to RSAC Findings and Recommendations on the FY 2003 President's Budget Request for Science and Technology

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The RSAC Report, "FY 2003 Presidential Science and Technology Budget Request for the Environmental Protection Agency; An SAB Review," presented many important findings and recommendations in its response to the charges placed by the Agency before the Committee by the Administrator. The Agency's response below addresses specific concerns and recommendations raised by the Report.

RSAC Charge Topic #1: Does the budget request reflect priorities identified in the EPA and ORD Strategic Plans?

Recommendation: The Agency should ensure that programs developed to satisfy strategic goals reflect the appropriate balance between risk characterization and risk mitigation.

- The Agency believes that ORD's participatory research prioritization process results in a resource allocation that strikes the optimal balance between risk characterization and risk mitigation research that best supports EPA's mission. The process begins during the annual research planning process when the Office of Research and Development (ORD) draws input from the EPA Strategic Plan, the ORD Strategic Plan, available research plans, EPA Program Offices and Regions, and Federal research partners. ORD and its partners then examine existing knowledge on exposure assessment, hazard identification, dose-response assessment, and risk assessment and management, in order to determine the optimal research approach.

Recommendation: The Agency should use its mandate and its interactions with other agencies to act on global environmental issues. EPA should also ensure that it does not focus exclusively on regions in which the United States has terrestrial boundaries with other countries.

- The Agency is active with other agencies in researching environmental issues across the globe. The U.S. Global Change Research Program (USGCRP), for example, is an interagency collaboration that works cooperatively with other nations to address global climate change. These international efforts help the Agency not only address national environmental problems but understand transboundary influences and affects.

Recommendation: The Agency should continue its post-doctoral program, and ultimately implement, a career path and recruitment program modeled after the comparable NIH program.

- As the RSAC stated, EPA began in 1999 a long-range program of hiring post-doctoral scientists and engineers for three-year term appointments. Our post-docs provide a dynamic infusion of intellectual energy and state-of-the-science expertise to ensure that

EPA continues to produce outstanding science and engineering in the field of environmental protection. This program will continue in FY 2003.

- EPA is considering modeling its hiring practices after the National Institutes of Health (NIH) program to: 1) provide stipends at levels necessary to hire or retain qualified junior and senior scientists and engineers; 2) create a limited-tenure system; and 3) establish senior term positions to fill critical investigative and science-management roles.

<u>Recommendation</u>: The Agency and Congress should find approaches to continue funding of the STAR Fellowship Program at EPA.

- EPA presently supports about 200 Science to Achieve Results (STAR) graduate fellows. The terms of those agreements provide funding for the next one or two years and the Agency plans to fully fund current fellows for the intended duration of their fellowships. However, funding for EPA's STAR Fellowship program shifted to the National Science Foundation (NSF) in FY 2003 as part of the larger Federal initiative to strengthen math and science programs. As a result, EPA does not plan to award any new STAR graduate fellowships.

- EPA will continue funding its Minority Academic Institutions (MAI) Fellowships program in FY 2003. EPA has made a major effort to increase outreach to minority institutions to ensure that African-American, Hispanic, Native American, and Pacific-Island students have access to the program. This program continues ORD's objective to recruit, retain, and develop a highly qualified and diverse workforce.

RSAC Charge Topic #2: Does the budget request reflect coordination between ORD and the Program Offices, including identification of the science needed to support major upcoming rules and decisions?

<u>Recommendation</u>: In future evaluations of the S&T account, it would be helpful for RSAC to know the research needs of the Program Offices that could not be met by ORD. It would also be helpful for the Agency to outline the major S&T priorities in each office and explicitly link these priorities to goals and budget levels.

- As part of EPA's Strategic Planning process, each Program Office outlines research priorities. These priorities are considered by the Agency as a whole in determining budget allocations and are linked to one of EPA's ten strategic goals. EPA will work in the future to ensure that these research needs are outlined clearly for the RSAC in the Agency's annual presentation of the EPA Science and Technology budget.

<u>Recommendation</u>: ORD should explore better mechanisms for establishing liaisons with other Federal agencies working in the environmental arena. ORD should also consider enhanced liaisons with the private sector.

- In addition to the U.S. Global Change Research Program described above, EPA currently has several successful partnerships with both Federal and private organizations. Some examples are listed below:

    - ORD has partnered with numerous Federal agencies through the Science to Achieve Results (STAR) grants program. These STAR partnerships include work with the National Science Foundation (NSF) in several research areas through the Technology for Sustainable Environment (TSE) program, which is now seven years old. TSE was recently complimented by Congress as a model of government cooperation.
    - ORD is part of a consortium of Federal agencies that are planning, developing and implementing the National Children's Study (NCS) of environmental influences on children's health and development.
    - In the area of ecosystems research, ORD has formed partnerships with all 26 coastal states and Puerto Rico for the National Coastal Assessment (NCA), and with 12 western states for the Western Pilot.
    - Cooperative Research and Development agreements (CRADAs) are another way in which EPA and private partners develop marketable technologies that protect human health and the environment. CRADAs provide a mechanism for cooperative research and development partnerships and promote the movement of Federal laboratory research into the products of U.S. companies.
    - One of ORD's new proposed programs in FY 2003, the National Environmental Technology Competition (NETC) seeks to further develop partnerships with the private sector by soliciting their involvement in the transfer and implementation of environmental technologies.

<u>Recommendation</u>: A quality management plan could help the Agency better integrate the research program elements with its GPRA Goals.

- The Agency works diligently to link research programs with GPRA goals in the annual budget process. It is also part of an on-going effort to report annual performance goals and measures to outside agencies.

RSAC Charge Topic #3: Does the President's Budget request provide adequate balance and attention to the core and problem driven research needed to provide satisfactory knowledge for current and future decisions EPA will be required to make?

<u>Recommendation</u>: RSAC strongly recommends that the Agency be vigilant in defining and maintaining core research needed to achieve a balanced S&T research program.

- The annual ORD research planning process includes a consideration of the overall

balance between "problem-driven" and "core" research and whether there is a need for adjustment. Core research focuses on increasing our understanding of environmental risks, while problem-driven research applies this understanding to meet more specific Program and Regional Office needs.

Recommendation: The "Summary of the 2003 Budget" could have provided a clearer distinction between core and problem-driven research.

- The Agency's Strategic Plan goal structure does not include explicit reference to core and problem-driven research categories. Accordingly, the FY 2003 Summary of the Budget does not break out resources according to core and problem-driven research. In addition, the Summary is a short synopsis of the full Congressional Justification allowing only limited descriptions of EPA's programs. EPA is committed to maintaining its core research capabilities, however, and will continue to refine and clarify the criteria by which research programs are classified.

Concern: Insufficient information was provided to allow RSAC to evaluate whether the President's budget request is adequate to support the research needed to satisfactorily inform the current and future decisions EPA will be required to make.

Example: The problem-driven research efforts identified in the Clean Air, Clean and Safe Water, and Safe Foods program goals were not identified in the highlights or in the annual performance goals.

- As the RSAC stated, EPA is committed to its research efforts in the Clean Air (Goal 1), Clean and Safe Water (Goal 2), and Safe Foods (Goal 3) goals. ORD's work in these areas addresses high priority Program Office needs while contributing to a stronger scientific understanding of how to prevent environmental problems affecting our air, water, and food. Given the long-term and uncertain nature of research, not every research program will have a significant achievement each year. Only those annual performance goals (APGs) that represent the Agency's highest priority, planned accomplishments were identified as the most significant research achievements in FY 2003 (e.g. those APGs that appeared under Goals 5 and 8). A complete set of the Agency's APGs, as well as expanded narratives on each research program, can be found in the Congressional Justification.

Recommendation: RSAC is of the opinion that most of the Agency's core research resources should be devoted to the development of in-house capabilities.

- EPA identifies core research needs, which are then met by an optimal mix of in-house and extramural research. The Agency's research projects endeavor to arm the Agency, as well as its governmental and private sector partners, with the ability to solve difficult environmental problems with cutting-edge and innovative approaches. In light of the growing demand to realize the full benefits of these evolving areas, EPA recognizes the importance of further developing in-house capabilities to support future research.

RSAC Charge Topic #4: Is the EPA research and development program addressing the important issues needed to meet EPA's strategic objectives and protect human health and the environment in the US and globally? What important issues are not receiving adequate attention at the requested level of resources provided for the R&D program and the S&T budget?

<u>Concern</u>: Information about funding or staffing levels appear inconsistent with a meaningful commitment to the research.

Example 1: OAR indicated that the impact of indoor air on asthma was a science priority but did not explicitly address it as a key program.
Example 2: ORD's biotechnology and National Environmental Technology Competition did not appear to have clearly defined objectives or scope.

- OAR and ORD have separate, but related roles in supporting indoor environments and asthma programs. Research on the impact of indoor air on asthma is conducted by ORD in the areas of both indoor air toxics and indoor particulate matter (PM) research while OAR uses the results of that research to support voluntary programs and outreach efforts. Important research needs that the OAR asthma program has identified include exposure/ sensitization and their relationship to asthma as well as mitigation strategies and their impact on reducing asthma.

- As noted in the Summary document, the biotechnology research program and the National Environmental Technology Competition (NETC) are both new areas of focus for EPA in FY 2003. The biotechnology research program will develop scientific and policy-relevant information to assess and manage three potential risks: 1) allergenicity of proteins introduced into the food supply by engineered crops; 2) adverse ecological effects of non-target species as a result of unintended gene transfer; and 3) development of pest resistance to engineered crops. NETC works in partnership with government and industry to facilitate rapid implementation and diffusion of technologies. For example, the Agency will seek low-cost nitrous oxide (NOx), volatile organic compound (VOC), and PM monitors needed to support an emissions trading strategy for smog reduction, and will seek low-cost treatment technologies to remove arsenic in small drinking water systems. Through the NETC, it will competitively seek, evaluate and recognize, with prestigious awards, technologies that meet these and other needs.

- Expanded narratives providing further detail on the scope and objectives of all programs can be found in the Congressional Justification, along with specific resource amounts associated with these efforts in the Explanation of Change sections.

<u>Recommendation</u>: EPA should identify specific non-regulatory-driven issues of high importance to protecting human health, the environment, and ecosystems; and in the next budget (FY 2004) request adequate S&T funds to address approaches to mitigate such risks.

- The Agency's FY 2003 President's Request represents the resource allocation that best supports the Agency's mission of protecting human health and the environment within an

environment of limited resources. EPA continually evaluates its future directions based upon its stakeholders needs and the Nation's environmental problems and we will consider the RSAC's recommendations when developing future budget requests.

Concern: There are several areas that either have been removed from the budget or do not seem to be considered sufficiently as priority areas.

- While the EPA values the RSAC's input regarding the need for research in several important areas, it must also coordinate with Agency program needs outside the area of science and technology. However, there are several programs mentioned by the RSAC that the Agency does, and will continue to, support.

RSAC Charge Question #5: How can EPA better use measures of performance that focus on environmental outcomes to identify the impact of its research and development program and the funds that Congress provides for that program?

<u>Recommendation</u>: EPA should determine which outcomes or what percentage of specific outcomes are influenced by activities outside the Agency and its R&D programs. For outcomes that derive solely from Agency activities, relationships must be established between the magnitude of funding and the degree of performance as evidenced by environmental outcomes.

- Identifying outcomes that relate to research activities is a complex issue. In a 2000 General Accounting Report[1], it was noted that typical results of research activities, such as models, methods, and tools are inputs to the development of environmental standards, regulations, and policies. While it is projected that policies developed from EPA's research activities will produce positive outcomes, it is inherently difficult to link the original research activities to specific environmental outcomes. This is largely due to the fact that researchers are unable to control for multiple factors affecting the environment. Additionally, many research activities are designed in multi-year plans and take several years before realizing positive performance outcomes.

- As the RSAC noted, ORD has taken several steps to identify, through a logical framework, how its activities help to enable its customers to take the necessary actions to bring about environmental results. ORD will continue to develop linkages between its activities, research products, and the impacts of those products and looks forward to future RSAC input regarding these efforts.

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[1] *"Government Performance and Results Act: Information on Science Issues in EPA's Performance Report for Fiscal Year 1999 and Performance Plans for Fiscal Years 2000 and 2001."* Government Accounting Office (GAO) 2000.

RSAC Continuing Issue #1: How does EPA capture and use scientific knowledge generated by other organizations in its multi-year planning efforts for the EPA research and development program?

Concern: It is not evident in the Agency's multi-year planning processes that a systematic approach has been developed to achieve benefits from extensive use of knowledge generated by other organizations.

- ORD's multi-year plans (MYPs) are designed to provide a framework for integration across laboratories and centers, Agency Strategic goals, and other research organizations. This framework encourages communication with ORD's peers, customers, and stakeholders, both within the Agency and externally, promoting exchange of knowledge between ORD and other organizations.

- The draft MYPs are in various stages of completion and will undergo internal and external peer review to ensure that ORD focuses on the highest priority science within the larger context of the environmental research community. In subsequent drafts of the MYPs, ORD will emphasize achieving benefits from the use of external knowledge, including ORD's extensive cooperation with others through joint grants, collaborative research, and cooperative research and development agreements.

RSAC Continuing Issue #2: To what extent is there adequate peer review of the science available for policy and regulatory decisions at EPA, particularly peer review of the planning for the R and D program and of the products from the R and D program?

No recommendations or concerns.

RSAC Continuing Issue #3: What is the assessment of the committee (RSAC) of the quality of the science being done at EPA, particularly that supported by the S&T budget?

Recommendation: The Agency needs to increase the publication of its research and development work in external peer-reviewed/refereed journals.

- It is not clear upon what data RSAC's recommendation is based, however, EPA agrees with the RSAC that publication in peer-reviewed/refereed journals is a key factor in gaining recognition of the integrity and excellence of our science and scientists. On an annual basis, scientists in ORD publish 500 to 600 articles in peer-reviewed/ refereed journals. In addition, scientists in the academic community funded by ORD's Science to Achiever Results (STAR) program publish an average of 650 journal articles per year. ORD anticipates that these numbers will continue to increase as we focus on publishing work in our highest priority research areas.