FISCAL YEAR 2005 ENVIRONMENTAL PROTECTION AGENCY BUDGET

HEARING

BEFORE THE

SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY, AND STANDARDS

COMMITTEE ON SCIENCE

HOUSE OF REPRESENTATIVES

ONE HUNDRED EIGHTH CONGRESS

SECOND SESSION

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FISCAL YEAR 2005 ENVIRONMENTAL PROTECTION AGENCY BUDGET

THURSDAY, MARCH 11, 2004

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY, AND STANDARDS,
COMMITTEE ON SCIENCE,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:00 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Vernon J. Ehlers [Chairman of the Subcommittee] presiding.

COMMITTEE ON SCIENCE
U.S. HOUSE OF REPRESENTATIVES

FY 2005 EPA Budget

Thursday March 11, 2004

10:00 AM – 12:00 PM
2318 Rayburn House Office Building (WEBCAST)

Witness List

Mr. Clay Johnson, III
Deputy Director of Management,
Office of Management and Budget

Dr. Paul Gilman
Assistant Administrator for Research and Development,
U.S. Environmental Protection Agency

Mr. Paul Posner
Managing Director, Federal Budget and Intergovernmental Relations,
General Accounting Office

Dr. Gene Matanoski
Professor, Department of Epidemiology,
Johns Hopkins University
Chair, EPA Science Advisory Board Review of EPA's FY 05 Budget
Former Chair, EPA Science Advisory Board

Dr. Costel D. Denson
Professor, Department of Engineering,
University of Delaware,
Member of the National Research Council Panel Review,
The Measure of STAR: Review of the EPA's Science to Achieve Results (STAR) Research Grants Program

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HEARING CHARTER

SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY, AND STANDARDS

COMMITTEE ON SCIENCE

U.S. HOUSE OF REPRESENTATIVES

Fiscal Year 2005 Environmental Protection Agency Budget

THURSDAY, MARCH 11, 2004
10:00 A.M.—12:00 P.M.
2318 RAYBURN HOUSE OFFICE BUILDING

1. Purpose

On Thursday, March 11, 2004 at 10:00 a.m. the House Science Subcommittee on Environment, Technology, and Standards will hold a hearing to examine the Environmental Protection Agency's (EPA) fiscal year (FY) 2005 budget request that proposes steep cuts in the Science to Achieve Results (STAR) grants program. Managed by EPA's Office of Research and Development (ORD), the STAR program supports research at colleges and universities on a wide array of environmental science issues.

The hearing will examine why the Administration has proposed a $35 million (or 35 percent) reduction in the grant program and the consequences of the reduction.[1] Specifically, the proposed reduction would reduce EPA-sponsored external (also called extramural) research on pollution prevention and eliminate STAR funding for research in the areas of ecological systems, endocrine disruptors, hazardous substances and mercury. The hearing will also examine the extent to which the Office of Management and Budget's (OMB) effort to assess the performance of government programs under OMB's Program Assessment Rating Tool (PART) led the Administration to propose these reductions.

The Subcommittee plans to explore the following questions:

1. Why does EPA's FY05 budget request propose to eliminate funding for EPA's STAR research grants to colleges and universities for research on ecological systems, pollution prevention, endocrine disruptors, hazardous substances, and mercury? What are the consequences of these reductions?
2. To what extent did the OMB's PART review of EPA's ecological and pollution prevention research programs drive these reductions?
3. How can the performance of environmental research programs best be measured? How do OMB's efforts to assess the performance of EPA's program differ from those of the National Academy of Sciences and EPA's Science Advisory Board?

2. Witnesses

- **Mr. Clay Johnson III,** Deputy Director for Management, Office of Management and Budget.
- **Dr. Paul Gilman,** Assistant Administrator, Office of Research and Development, Environmental Protection Agency.
- **Mr. Paul Posner,** Managing Director, Strategic Issues, U.S. General Accounting Office (GAO); Managed GAO's recent report, *Performance Budgeting: Observations on the Use of OMB's Program Assessment Rating Tool for the Fiscal Year 2004 Budget,* GAO–04–174.
- **Dr. Genevieve Matanoski,** Professor, Johns Hopkins University, Chair, EPA Science Advisory Board's Review of EPA's FY 2005 Budget Request; former Chair, EPA's Science Advisory Board (SAB).

[1] The proposed reductions to the STAR program described here and in detail below are compared to the President's FY04 budget request. EPA's final FY04 spending will not be available until the agency's operating plan is completed.

- **Dr. Costel Denson,** Professor, University of Delaware, member of the National Academy of Sciences panel that authored *The Measure of STAR: Review of the U.S. Environmental Protection Agency's Science to Achieve Results (STAR) Research Grants Program* (2003).

3. Brief Overview

The President's budget for FY05 proposes to cut Science and Technology (S&T) at EPA by $92 million, or about 12 percent. The most significant percentage cut to S&T (other than the elimination of earmarks) would reduce funding for EPA's external grants program by almost 35 percent.

These proposed cuts to the grant program, known as Science to Achieve Results (STAR), are especially noteworthy because in the last decade a number of outside experts, including the National Academy of Sciences (NAS), have urged EPA to fund research outside of its own laboratories. Most notably, the NAS praised the STAR grant programs in its 2003 report, *The Measure of STAR: Review of the U.S. Environmental Protection Agency's Science to Achieve Results (STAR) Research Grants Program.* The report argues that the external STAR grants are a critical means for the agency to have access to expertise that it does not have in-house, and to respond quickly to emerging issues. The external grants have also often been favored by critics of EPA who view EPA's in-house scientists as too likely to come up with research results that would favor a pre-existing regulatory agenda.

The cuts to STAR have also attracted attention because they can be seen as a test case of how the Administration is using a new system the Office of Management and Budget (OMB) has created to evaluate the effectiveness of federal programs and inform spending decisions. The system is known as the Program Assessment Rating Tool (PART). Each year, OMB is selecting programs at each agency to evaluate using PART. It hopes to have reviewed all programs within the next four years.

The proposed cuts to STAR raise two sets of questions about PART: How fairly does the PART tool evaluate programs? And how does the Administration apply PART evaluations in making budget decisions? The General Accounting Office (GAO) recently weighed in on the first question with a report, Performance Budgeting: Observations on the Use of OMB's Program Assessment Rating Tool for the Fiscal Year 2004 Budget (see more detail below).

The proposed cuts to STAR raise particularly thorny questions about the use of PART. Most problematically, STAR grants are part of larger programs targeted at particular environmental issues. The STAR grants targeted for cuts are part of five separate research programs: ecological systems, pollution prevention, endocrine disruptors, mercury, and hazardous substances. The PART was applied to the first two programs as a whole; the external grants were not evaluated as a separate element. The other three programs were not evaluated at all. Other issues about the way PART relates to the STAR program and EPA's research and development (R&D) programs are described below.

The Five Programs—What They Do And What Would Be Cut

Ecological Research. EPA characterizes the $110 million ecological research program as a core or basic research program. Its goal is to develop the scientific understanding to determine ecosystem conditions and trends, diagnose impairments, forecast ecosystem vulnerability and, ultimately, restore degraded ecosystems. For example, recent STAR funded research has been instrumental in developing scientifically grounded ways to measure water and ecosystem quality[2] along the Nation's coastal areas and in the mid-Atlantic region.

According to EPA, the $22 million cut to STAR would eliminate 50 grants in FY05 across all areas of the ecological research program. The proposed cuts would slow research on water quality in FY05 in the Ohio and Mississippi River basin and eliminate grants for research in such areas as western rivers and streams, the Great Lakes, and the Gulf of Mexico.

Pollution Prevention. EPA's pollution prevention research program develops tools, technologies, and new systems for preventing pollution. Most of the $50 million program funds applied research, such as the development of innovative technologies for reducing the use of hazardous solvents. However, a small portion of the program supports extramural grants for more basic research on sustainable technologies. For example, in work that EPA carries out in partnership with the National Science

[2] A large portion of the STAR grants in ecological research support the measurement of ecological conditions and most of ecological condition research is carried out through the Environmental Monitoring and Assessment program (EMAP) program, a program that the Committee has supported in recent years.

Foundation, EPA supports research in so-called "green chemistry," which promotes safer chemicals and chemical manufacturing processes.

The proposed budget would redirect $5 million from research to a pollution prevention outreach program in another part of the agency. Redirecting these funds would eliminate $3 million in STAR funding, which is EPA's contribution to the EPA–NSF partnership.

Endocrine Disruptors. EPA's $13 million research program focuses on providing a better understanding of the effects of endocrine disruptors and on humans, wildlife, and the environment. EPA also is developing new methods to screen chemicals for their potential endocrine effects. The program invests in both basic and applied research.

The proposed budget would cut $4.9 million, which would eliminate the entire STAR grant research program on endocrine disruptors. The funds would otherwise have supported research on the extent to which humans and wildlife are exposed to endocrine disruptors, an area that the NAS and the World Health Organization have identified as an important research gap.

Mercury. The goals of EPA's $7 million mercury research program are to reduce and prevent the release of mercury into the environment and to understand how mercury moves through the environment. This research supports a variety of the agency's air and water regulatory programs by developing control technologies, measuring mercury deposition, and attempting to understand the effect of mercury on wildlife. The proposed $1.9 million reduction to the STAR grant portion of the mercury research program would eliminate STAR research in FY05 on how and where mercury moves through the environment.

Hazardous Substances. EPA established five university-based centers affiliated with 22 universities to address concerns about hazardous substances in the environment. Each center has developed a research program to meet regional needs. Centers are based at Johns Hopkins University, Louisiana State University at Baton Rouge, Purdue University, Colorado State University at Fort Collins and Oregon State University at Corvallis. The proposed $2.3 million dollar reduction in STAR funding would eliminate ORD's contribution to these centers.

What is the Value of Extramural Research at EPA?

The NAS reviewed EPA's STAR program in 2003. The report, *The Measure of STAR: Review of the U.S. Environmental Protection Agency's Science to Achieve Results (STAR) Research Grants Program,* reaffirmed earlier National Academy recommendations that EPA should maintain an appropriate balance between its intramural and extramural research programs. (See the Attachment A for a summary of the report.) The report gave the STAR program a strong endorsement, calling it "EPA's pre-eminent program that solicits independent scientific and technologic research from the Nation's best academic and non-profit research institutions." It also described STAR as enabling EPA to have access to the broad research community, fund research at the cutting edge of science, respond quickly to new issues, and address research gaps when EPA lacks the appropriate in-house expertise. It specifically praised the unique contributions that the STAR program is making to endocrine disruptors and ecological indicators research. The report concluded by recommending that ORD maintain STAR funding at a level somewhere between 15 and 20 percent of ORD's total budget.[3]

What is the Program Assessment Rating Tool (PART) and what did GAO conclude in its recent assessment of the PART?

The Program Assessment Rating Tool (PART) is a new evaluation tool developed by OMB to assess the performance of federal programs and to link that performance to spending decisions. It judges programs on their purpose and design, strategic planning, management and results, heavily weighting the results portion of the review. Based on the review, OMB rates a program as either effective, moderately effective, adequate, ineffective, or "results not demonstrated." (See Attachment B for a more detailed description of the PART.) OMB plans to apply the tool to all federal programs within the next four years.

The Government Accounting Office (GAO) recently reviewed the PART process, though it did not specifically review its application to R&D programs (*Performance Budgeting: Observations on the Use of OMB's Program Assessment Rating Tool for the Fiscal Year 2004 Budget,* GAO–04–174). (See Attachment C for a summary of

[3] If this were the case, and ORD were to be funded at $572, the level requested in the President's FY05 budget request, STAR funding would then need to be between $86 million and $114 million. However, the President's request for STAR in FY05 appears to be no more than $65 million, and may be even less than that.

the GAO report.) According to GAO, the PART process has reinvigorated the Executive Branch's focus on performance budgeting. However, GAO also concluded that OMB must do more to ensure fair and consistent application of the PART. GAO described the PART as "a work in progress" and needing "[a]dditional guidance and considerable revisions. . .to meet OMB's goal of an objective, evidence-based assessment tool." GAO concluded that there are inherent challenges when applying the PART's restrictive yes/no format to programs with multiple purposes and goals, and recommended, among other things, that OMB clarify subjective terminology, provide flexibility in judging complex programs, clarify when output and outcome measures are appropriate, and increase dialogue with agency staff on such things as the definition of the program that will be reviewed.

The way OMB applied the PART to EPA's S&T programs may illustrate some of GAO's concerns. For example, many of EPA's R&D programs have multiple goals and purposes, such as combining basic and applied, as well as intramural and extramural research, in one program. In addition, OMB's decision to evaluate the overall ecological research program may have led to challenges for EPA, which had never evaluated the entire program.[4]

What did the PART evaluation conclude about the ecological research and pollution prevention programs and was the PART applied fairly?

OMB used the PART to evaluate two of the five programs with extramural research elements that were cut in the President's budget. OMB concluded that the ecological and pollution prevention research programs could not "demonstrate results," because neither had adequate standards to measure the progress of the programs.[5]

EPA has said it disagrees with how OMB applied the PART and the conclusions it reached. The primary area of disagreement appears to be over how to measure the performance of EPA's R&D programs.[6] For example, EPA views the ecological research program as more of a basic research program, making it similar to research supported by the National Science Foundation (NSF). In OMB's PART review of NSF programs, it measured the performance of those programs using process indicators, such as whether the agency has conducted the appropriate peer reviews and how quickly it processes research grants. EPA maintains that its program should be similarly evaluated.

OMB, however, seems to want more than process measures to evaluate EPA's R&D programs. According to both EPA and the public PART review documents, OMB seems to want EPA to measure its programs less on process and more on output and outcome measures, such as the degree to which others used the products of the research, and how much pollution the research reduced or might reduce in the future. EPA agrees that its research strategic plans should make the connection between research and eventual reductions in pollution. However, it does not believe that either its basic or applied research programs should be held accountable for the actions of others who are outside of EPA's control and who may or may not use EPA's research products.

EPA seems to believe that its R&D programs should be evaluated through a peer review process that considers the degree to which the research reflects the state of the science, adds knowledge to the field, and creates tools and methods that others could use. This view seems consistent with the views of EPA's SAB and various NAS reports, such as the STAR report, on the proper way to evaluate R&D. These reports have also praised EPA's for developing high quality basic, extramural research programs that develop knowledge, but are not tied to regulatory results.

Why was the ecological research and pollution prevention program cut and who decided to cut it? Was the decision related to the PART?

The Administration's proposed budget clearly shows that OMB decided to cut the ecological and pollution prevention research programs because of their low PART scores. OMB's specific mention of the amount of the proposed reduction in the PART summaries makes this readily apparent. However, what is less clear is why these programs were cut when many other EPA programs could not demonstrate results

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[4] EPA has evaluated subprograms that cut across all of its research programs, such as the STAR program, and elements of the ecological research program, such as Environmental Monitoring and Assessment Program.

[5] See OMB's PART summaries, where it specifies reductions to these programs at *http://www.whitehouse.gov/omb/budget/fy2005/pdf/ap_cd_rom/part.pdf*

[6] EPA also disagrees with OMB's conclusion that the ecological research program failed to coordinate its research agenda within EPA or with outside agencies or researchers (suggesting redundancies with other programs), and that previous evaluations of the ecological research program were too focused on process measures.

either. OMB evaluated a total of 20 EPA programs in FY04 and could not determine results for 13 of them. Of those 13, some are proposed for decreases, some for increases and others for flat funding. The rationale for the uneven treatment is unclear.

Why was the STAR portion of these programs cut and who decided to cut it?

OMB's PART review did not address the STAR program, other than a brief mention of NAS's positive review of the STAR-funded ecological research. As a result, it appears that the STAR cuts may have emerged from EPA as it decided how to allocate the overall reductions required by OMB. The ultimate reason, however, is difficult to know because final decisions on reductions are usually made in negotiations between the agency and OMB, which are not made public.

4. Witness Questions

Questions for Clay Johnson III, Deputy Director for Management, Office of Management and Budget

In your testimony, please describe the justification for the proposed reductions to EPA's STAR grant research on ecological systems, pollution prevention, endocrine disruptors, and mercury. In particular, please focus your testimony on the following questions:

1. To what extent is the proposed reduction in each of these research areas based on the evaluation of EPA's research programs that OMB undertook with the PART?
2. Given that the PART review did not specifically assess the extramural portion of the research programs, why was the extramural portion of the program cut?
3. Why does OMB's PART review of the ecological research program tend to treat it as an applied research program when EPA characterizes it more as basic research? Is a single performance score under the PART tool appropriate for reviewing a diverse research program, such as EPA's endocrine disruptor research, that combines basic, applied, intramural and extramural research? To what extent, should EPA's R&D performance measures be based on specific regulatory program outcomes or environmental outcomes?
4. Does OMB agree with the Government Accounting Office's recommendations for improving the PART process and its content? How will you implement those recommendations?

Questions for Paul Gilman, Assistant Administrator, Office of Research and Development, U.S. EPA

Please give a brief description of the STAR extramural research program and how it fits into EPA's overall R&D program. In addition, please answer the following questions:

1. Given the positive review by the National Academy of Sciences of the STAR program last year, why was the STAR program cut?
2. Given the elimination of EPA's STAR grants for research on ecological systems, pollution prevention, endocrine disruptors and mercury, does EPA now believe it no longer important to seek out the expertise of university researchers in these fields.
3. How does EPA's ecological research compare to research supported by the National Science Foundation and other federal research programs? To what extent does EPA coordinate its research with those agencies?
4. Does EPA characterize its research on ecological systems, pollution prevention, endocrine disruptors and mercury as basic or applied research?
5. What performance measures are most appropriate for evaluating these programs? To what extent does EPA believe that the performance measures for these programs should be tied to the outcomes of specific regulatory programs or environmental outcomes?
6. What research would not be done as a result of the proposed reductions and what impact would this have on our scientific understanding and EPA's regulatory programs?

Questions for Paul Posner, Managing Director, Strategic Issues, U.S. Government Accounting Office.

In your testimony, please describe GAO's findings and recommendations concerning the PART and answer the following questions:

1. What unique problems do research programs raise for evaluation tools like PART? What types of evaluation techniques and performance measures are most appropriate for reviewing basic research programs and what types are most appropriate for applied research? How should OMB decide whether a research program should be evaluated as a basic or applied program?
2. How should the PART deal with programs that have several distinct elements, for instance a single research program that funds both basic and applied, and intramural and extramural research?

Questions for Gene Matanoski, Professor, Department of Epidemiology, Johns Hopkins University; Chair, EPA Science Advisory Board FY05 Budget; Former Chair, EPA Science Advisory Board

In your testimony, please describe the Science Advisory Board's views on the proposed cuts to the STAR grant program and OMB's PART review of the ecological and pollution prevention research programs. In addition, please answer the following questions:

1. What has the SAB recommended to EPA in terms of balancing its research and development (R&D) investments between intramural and extramural research and between basic and applied research? Are SAB's recommendations consistent with recommendations from other reviews of EPA's science programs?
2. What performance measures are most appropriate for evaluating EPA's research programs on ecological systems, pollution prevention, endocrine disruptors and mercury? To what extent should performance measures differ for basic and applied research programs at EPA? Should EPA's R&D performance measures be tied to the outcomes of specific regulatory programs or environmental outcomes?

Questions for Costel Denson, Professor, Department of Engineering, University of Delaware; Member of the National Research Council panel for the report, The Measure of STAR

1. How important are the extramural portions of EPA's research efforts, including those for research on ecological systems, pollution prevention, endocrine disruptors, and mercury? What are the likely effects the elimination of these grants will have on our scientific understanding and EPA's regulatory programs?
2. How important is it that EPA ensures that some portion of its environmental research funding support extramural research? What portion is an optimal amount?
3. What performance measures are most appropriate for judging the performance of EPA's STAR grant program? To what extent should the STAR program be evaluated as basic research or applied? How well does the STAR program perform relative to other federal research programs of similar design?
4. What actions should EPA take to strengthen its STAR research grant program?

5. Attachments:

Attachment A. Summary of the NAS Report on STAR

Attachment B. Summary of the PART program and process.

Attachment C. Summary of the GAO Report on PART

Attachment A

THE MEASURE OF STAR

Review of the U.S. Environmental Protection Agency's Science to Achieve Results (STAR) Research Grants Program

Committee to Review EPA's Research Grants Program

Board on Environmental Studies and Toxicology

Division on Earth and Life Studies

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Summary

In an effort to improve the scientific foundation of the Environmental Protection Agency (EPA) decision-making process, EPA's Office of Research and Development (ORD) created the Science To Achieve Results (STAR) program in 1995. The STAR program is a competitive, peer-reviewed, extramural research grants program intended to increase the agency's access to the nation's best scientists and engineers in academic and other nonprofit research institutions. It supports research pertaining to human health and the environment and is designed to maximize the independence of the researchers supported and to provide an equal opportunity for all researchers to qualify for support.

The STAR program, currently managed by ORD's National Center for Environmental Research (NCER), is integrated into EPA's overall research program through extensive planning and consultation with the agency's other research centers and laboratories and its program and regional offices. The research sponsored by the STAR program allows the agency to fill information gaps that are not addressed completely by its intramural research program and to respond to new issues that the EPA laboratories are not able to address.

The research support awarded by the STAR program is of three main kinds: grants awarded to individual investigators or small groups of investigators, grants awarded to multidisciplinary (and sometimes multi-institutional) research centers, and fellowships to support graduate work (at the master's and Ph.D. levels) in environmental sciences. The program has been funded at about $100 million per year over the last few years and accounts for 15-20% of ORD's research budget. The program has leveraged its funds by forming partnerships with other agencies that support

similar kinds of research. Since it was established, the components and management of the program have adapted in response to changing agency needs, experience gained in operating the program, and external reviews.

CHARGE TO THE COMMITTEE

In 2000, EPA asked the National Research Council to conduct an independent assessment of the STAR program. In response, the Research Council established the Committee to Review EPA's Research Grants Program, which prepared this report. The committee was given the following task:

> The NRC committee will conduct a program review of EPA's Science To Achieve Results (STAR) competitive extramural research grants program. Using information to be obtained from EPA, STAR grant recipients, and other sources, the committee will assess the program's scientific merit, its demonstrated or potential impact on the agency's policies and decisions, and other program benefits that are relevant to EPA's mission. The committee will recommend ways to enhance the program's scientific merit, impact, and other benefits. In the context of other relevant research conducted or funded by EPA, and in comparison with other basic and applied research grant programs, this assessment will address the STAR program's research priorities, research solicitations, peer-review process, ongoing research projects, results and dissemination of completed research, and other aspects to be identified by the committee.

In undertaking its review, the committee held three public sessions in which it heard presentations about the STAR program by EPA officials and others. The EPA officials represented NCER and other EPA research and program offices. The public sessions included presentations by representatives of other federal agencies that support extramural research and by experts in evaluating research programs. Committee members also interviewed STAR project officers and STAR grant and fellowship recipients and attended STAR sponsored workshops and meetings. NCER staff provided the committee with substantial amounts of information regarding the operation and financing of the program.

THE COMMITTEE'S EVALUATION

The committee's evaluation of the STAR program focused on the program's quality, relevance, and performance as described in the recent Office of Management and Budget (OMB) guidelines on evaluating research programs. The committee used metrics that grew out of its review of information available from EPA and of metrics used by EPA and other organizations. The metrics, which are both quantitative and qualitative, assisted the committee in forming judgments regarding the scientific merit of the program and its impact on the agency.

The committee recognizes that the STAR program is still too young to provide all the information needed for a full evaluation of the extent, impact, and value of its activities. Evaluation of research results is difficult and requires substantial elapsed time; for a given topic, it can take 3-5 years from the initiation of laboratory or field experiments to the analysis and publication of results. Considerably more time must elapse to realize the impact of published research on the scientific and regulatory communities. Nevertheless, the committee judged that it had sufficient information to evaluate how the STAR program operates and its value to the nation's overall environmental research and management efforts.

To effectively communicate its findings in this summary, the committee developed and addressed a series of specific questions that it believed would be of greatest interest to the audience of this report. On the basis of its evaluation, the committee unanimously arrived at the following conclusions and recommendations.

Should the STAR program continue to be part of the ORD research program?

Finding. EPA requires a strong and balanced science and technology research program to fulfill its mission properly. The STAR program is an important part of the overall EPA research program.

Several previous reports by EPA and the National Academies have addressed the question of whether EPA should have its own research program or rely on research results developed elsewhere. Those reports all concluded emphatically that EPA needs its own strong research program to meet the needs of its mission. The committee concurs with that conclusion.

The STAR program is EPA's preeminent program that solicits independent scientific and technologic research from the nation's best academic and other nonprofit research institutions. The program has established and maintains a high degree of scientific excellence. By funding the majority of its research efforts through broadly advertised, competitive grants, the STAR program provides the agency access to independent information, analyses, and perspectives.

The research portfolio of the STAR program is derived directly from the strategic plans of EPA and ORD and from ORD's more-detailed research strategies that address particular topics. It is an integrated part of EPA's research program. The STAR program provides the agency access to a broad community of researchers, allows it to fund research at the cutting edge of science, and assists it in addressing information gaps that it does not have the internal resources to address properly. The STAR program also encourages its grantees to disseminate their research results widely to promote their rapid and widespread use.

For all those reasons, STAR research effectively expands the nation's scientific foundation for protecting human health and the environment. Moreover, by expanding environmental research and analysis capabilities in many of the nation's academic and other nonprofit research institutions and by supporting young scientists interested in environmental research, the STAR program actively expands the nation's environmental-science infrastructure.

Recommendation. The STAR program should continue to be an important part of EPA's research program.

What is the unique contribution of the STAR program?

Finding. The STAR program funds important research that is not conducted or funded by other agencies. The STAR program has also made commendable efforts to leverage funds through establishment of research partnerships with other agencies and organizations.

The STAR program provides EPA with access to independent research that is directly relevant to its mission. The program makes strong efforts to ensure that the results of its research are expeditiously communicated to relevant EPA program offices and to other potential users. The STAR pro-

gram gives primary potential users of research results a unique role in helping to plan the research and to identify the specific high-quality proposals that will be of greatest value to them. The exploratory and core research that the program sponsors alerts the agency to possible emerging issues, providing more opportunity for the agency to consider how it might best address them.

Much of the research funded by STAR would not have been undertaken without the program, because it is not conducted or funded by other agencies. For instance, EPA is one of the few agencies that provide extramural funding for examining the impacts of endocrine disruptors on ecosystem processes. The STAR ecologic-indicators program is the primary source of support of research on the development of water-quality indicators for biologic monitoring. The interdisciplinary centers that STAR has supported also represent an innovative approach to supporting research that will be most relevant for environmental decision making in several important topics.

Finally, the STAR program has been successful in working with other agencies that have similar or complementary research interests through research partnerships and in obtaining supplementary funding. That not only leverages additional funds for research projects of interest to STAR but also helps to increase the partner agencies' awareness of the pertinent issues and information needs of EPA. The STAR program's ability to establish partnerships has increased as more funds have been allocated to it.

Recommendation. STAR should continue to partner with other government and nongovernment organizations to support research of mutual interest and of relevance to EPA's mission, explore innovative approaches for carrying out this research, and sponsor a diverse portfolio of research that alerts the agency to emerging issues and provides independent analyses of issues that the agency is currently addressing.

Does the STAR program have adequate processes to ensure that it is sponsoring high-quality and relevant research?

Finding. The procedures that STAR has established for soliciting and selecting the highest-quality research proposals compare favorably with the procedures established by other research agencies. STAR's procedures for incorporating mission relevance into its research-planning process and in

the selection of proposals to fund exceed those practiced by most other agencies.

The STAR program has developed a grant-award process that compares favorably with and in some ways exceeds that in place at other agencies that have extramural research programs, such as the National Science Foundation (NSF) and the National Institute of Environmental Health Sciences. An unusually high degree of planning goes into identifying the specific research subjects to be supported. The agency also puts considerable time and thought into preparing effective research solicitations and into funding projects that are relevant to its mission and program needs.

EPA spends substantial effort in defining its research agenda, and the STAR program submits its proposed requests for applications (RFAs) to extensive review within the agency. Those efforts are intended to ensure that the research requests are focused on the issues most important to EPA.

However, the STAR program makes insufficient use of outside experts in planning its research agenda and in identifying the most important gaps in scientific knowledge. As a result, some of its early RFAs were not as well focused as they should have been.

In soliciting research proposals, STAR makes a substantial effort to reach out to the broad scientific community and to attract the most capable scientists. The RFAs are distributed widely through EPA's Web site, the *Federal Register*, announcements at professional meetings, and e-mail distributions to individuals or institutions that sign up on the STAR Web site. When the desired research is outside EPA's traditional research fields and might therefore include scientists not already involved with the agency's research program, STAR often solicits the help of other agencies that traditionally work with these scientists to ensure that they are aware of the funding opportunities.

The STAR program has established a rigorous peer-review process. Such peer-review processes are a key part of the foundation on which excellence is achieved in all research programs, including those of the National Institutes of Health (NIH) and NSF. The agency has taken effective steps to ensure that the process does not suffer from conflicts of interest and is independent. EPA provides a "firewall" that shields the peer-review process from the influence of the project officers and staff who oversee the individual-investigator, fellowship, and center awards.

Recommendation. The STAR program should continue to improve the focus of its RFAs, and when the agency does not have the capacity inter-

nally to adequately define the state of the science in a particular research field, STAR should consider greater use of external experts to assist in identifying the highest-priority research and data gaps.

Is the STAR program producing high-quality research results?

Finding. Although it is still too early for comprehensive evaluations of the research results of the STAR program, some STAR research efforts have already substantially improved the scientific foundation for decision making, and the results produced by STAR investigators have been widely published in peer-reviewed journals.

Evaluating the quality of research results is difficult and necessarily involves substantial judgment on the part of scientists with expertise in the research fields being reviewed. In addition, because of the relative youth of the STAR program, only about 40% of STAR research projects funded to date have been completed.

However, many STAR projects have resulted in articles in highly respected, peer-reviewed journals—a traditional measure of research quality. These STAR research results have already helped to improve our understanding of the causes, exposures, and effects of environmental pollution—information critical to improving the scientific foundation for decision making. For instance, STAR-funded research on particulate matter has helped to improve our understanding of the biologic mechanisms by which inhaled ambient particles cause health effects and the nature of some of those effects. These data are critical to future regulatory decisions regarding our nation's ambient air quality.

A limited bibliometric analysis by the committee indicated that the citation rate of STAR-supported research is comparable with that of research in the same fields funded by other research organizations and undertaken by other investigators. For instance, in 1997, the average number of citations of STAR-funded ecologic research was 10.5, compared with 10.3 citations of the work of all other investigators in ecology.

The committee also reviewed the backgrounds and accomplishments of a sample of STAR-funded principal investigators. The review indicated that the STAR program was funding many scientists with outstanding credentials; they have impressive research track records and are leaders in their fields; are editors of journals or officers in societies and have received awards of distinction; and were attracted to the STAR program from fields outside EPA's mission.

On the basis of the STAR program's process for awarding grants, the quality of the individuals and institutions funded by the program, and the highly competitive nature of the awards, the committee is confident that the products of STAR grants are of the highest quality.

Recommendation. EPA should continue its efforts to attract "the best and the brightest" researchers to compete for STAR funding.

Are the STAR program results useful for EPA decisions and processes?

Finding. The STAR portfolio effectively supports EPA's mission, Government Performance and Results Act goals, and ORD strategic plans. Specific STAR research projects have yielded significant new findings and knowledge critical for regulatory decision making.

The STAR program is too young to be able to document fully the extent to which its research results are being used to inform development of new regulations and environmental-management decisions. Even with respect to projects that have been completed, there is often a substantial delay between when the research results are produced and the agency decides to undertake rule-making or other actions to address the issues that were studied.

However, some STAR projects have already yielded information important for environmental decision making. For example, STAR-sponsored research in endocrine disruptors, particulate matter, and ecologic assessment has resulted in groups of peer-reviewed publications of immediate use in understanding causes, exposures, and effects of environmental pollution. Those results are directly relevant to EPA's mission to "protect human health and to safeguard the natural environment—air, water, and land—upon which life depends." For instance, STAR-funded research on particulate matter has helped to improve our understanding of the biologic mechanisms by which inhaled ambient particles cause health effects. Research on ecologic indicators has led to the development of a dynamic, economically linked model to evaluate the driving forces and ecologic consequences of land-use change.

In research fields in which EPA does not already have substantial expertise, the committee suggests that the program consider bringing in outside experts to assist in assessing the state of the science while the research program is being planned and then to synthesize the contributions of the

STAR-supported research when it has been completed. Such assessments would help EPA to target RFAs and then analyze the utility of the completed research in providing critical knowledge or otherwise strengthening and improving the foundation for environmental decision making.

To ensure the usefulness of STAR research results, it is also important for the STAR program to maintain a balanced research portfolio, including balances between "core" and "problem-driven" research and between human health and ecologic research.

Recommendation. The STAR program and ORD should develop mechanisms for documenting the extent to which its research is being used to support the agency's environmental decision making, should consider using outside experts to help document systematically the "state of the science" before research is initiated, and should synthesize the results of the research when it is completed to identify the specific contributions that STAR and ORD research has made to providing critical information.

Is the STAR program effective in providing results relevant to the appropriate audiences?

Finding. The STAR program has been commendably aggressive in experimenting with innovative approaches to communicating the results of its funded research to a wide variety of users and audiences, but its success in these efforts has been uneven.

The STAR program supports research of potential value to a variety of users and audiences, both in and outside EPA. Much of the research is aimed primarily at the scientific community and those responsible for providing technical support for environmental-management decisions. For the scientific community, the primary communication product is peer-reviewed journal articles, and the program has been successful in encouraging the preparation of these articles.

The program, however, also has other potential users, at least for the results of some of its research. They include other federal agencies; industry; state, tribal, and local governments; nonprofit environmental organizations; and international environmental agencies. The audience for some projects appears to be local communities (for instance, communities that have received Environmental Monitoring for Public Access and Community Tracking, or EMPACT, grants) or the general public; disseminating results to such audiences is much more difficult.

The STAR program has experimented aggressively with a wide variety of communication mechanisms. Information is available to the public on EPA's Web site concerning every step of the STAR process, from the initial solicitation of research proposals, through the award of grants, to the final research results. STAR researchers are required to prepare annual progress reports, which are made available to the public in summary form. The STAR program also produces several series of reports that summarize research results in selected topics. In all those efforts, the program appears to substantially exceed the dissemination efforts of most other research-sponsoring organizations, both in and outside the federal government.

Nevertheless, the STAR program could substantially improve its dissemination efforts by directing its communication efforts more effectively to specific users and audiences. The program does not always clearly identify the users and audiences for its research results. Often, the research results are produced, and then EPA assesses how to communicate them. The dissemination process would be much more effective and efficient if the potential audiences were clearly identified before the research began and if the focus were maintained throughout the research process and the preparation of reports.

In some cases, the effective dissemination of results should be primarily STAR's responsibility. In other cases, STAR's contributions will be a component of a larger research effort, and the primary dissemination responsibility should lie with ORD or EPA. In all cases, however, dissemination efforts are likely to be more effective if the intended audiences are clearly defined from the beginning of the STAR grants process.

Recommendation. The STAR program should clearly identify the intended audiences for proposed research results as early in the process as possible and should identify the audiences in RFAs. When appropriate, EPA should consider involving representatives of the intended audiences from outside the agency in helping to define the relevant research results and the strategy for their dissemination.

Should the fellowship program continue to be part of the ORD research program?

Finding. The STAR fellowship program is a valuable mechanism for enabling a continuing supply of graduate students in environmental sciences

and engineering to help build a stronger scientific foundation for the nation's environmental research and management efforts.

The fellowship program was established to "encourage promising students to obtain advanced degrees and pursue careers in environmentally related fields" and to develop the next generation of environmental scientists. It is the only federal fellowship program exclusively designed for students pursuing advanced degrees in environmental sciences. It has achieved its goals, as evidenced by the extraordinary competition for the fellowships and the rigorous, independent selection process. Of the fellowship applications that STAR receives annually, only 125 fellowships, or 10% of all applicants, receive funding. Of the more than 100 former EPA fellowship recipients that were contacted by the committee, over 95% indicated high satisfaction with the program, and nearly 90% have remained in the environmental field, thus successfully contributing to the long-term program goals.

Recommendation. Given the nation's continuing need for highly qualified scientists and engineers in environmental research and management, the STAR fellowship program should be continued and funded.

Are the STAR program's funds adequate to achieve its objectives?

Finding. STAR is only able to fund less than 15% of the proposals received for its individual investigator and center grants, and its funding has not kept pace with the rate of inflation.

NIH and NSF strive to fund, on the average, 25-30% of the proposals received. STAR's budget allows it to fund only 10-15% of the proposals it receives and only about 60% of those rated "excellent" or "very good" by its independent quality peer-review panels. By that measure, STAR does not have sufficient funds to recognize all the best proposals received.

To be effective in its partnerships with other agencies, STAR must have sufficient funding to allocate to subjects of mutual interest to make it worth the extra administrative effort that partnerships require. The partnerships benefit STAR as a result of both the funds they leverage and the reputation they bring to the program.

Although the STAR program's budget grew rapidly in its first 3 years, it has not kept pace with general inflation in the last few years. That is

particularly true of the STAR fellowship program. The effect of that budgetary situation is exacerbated by the fact that costs of research have outpaced general inflation for more than a decade. Therefore, at present, STAR funds buy less research than the same amount of money could have bought several years ago.

It is appropriate to consider the funding of the STAR program in the context of the overall funding for all of ORD, which also has not kept pace with inflation. STAR currently represents about 18% of ORD's total funding. The committee considers that percentage to be a reasonable recognition of the value of independent peer-reviewed research to the agency.

Recommendation. STAR program funding should be maintained at 15-20% of the overall ORD budget, even in budget-constrained times. However, budget planners should clearly recognize the constraints of not having inflation escalators to maintain the level of effort of the entire program.

How should the STAR program be evaluated?

Finding. There are no easy answers when it comes to identifying metrics for evaluating research programs, and the best approach for evaluating the STAR program is to establish a structured system of reviews by panels of experts.

The STAR program has undergone a substantial—some might say excessive—number of reviews. Most of the reviews have focused on the program's procedures; it is too early in the program's life to be able to evaluate the research products fully. Too many reviews can be disruptive to the program and can divert the program's attention and resources from its primary purpose.

The committee, in its own evaluation of STAR, assessed the quality, relevance, and performance of the program, as set forth in recent OMB research and development criteria, by using qualitative and quantitative metrics selected on the basis of its review of information available from EPA and metrics used by EPA and other organizations. That is one approach for reviewing the STAR program and similar programs. Several examples of qualitative and quantitative metrics that were used for evaluating the STAR program are these: Does the STAR program have a clearly

defined plan for regular, external reviews of its research quality, and has this plan been effectively carried out? Has the program made significant contributions to advancing the state of the science in particular research topics? Does the program award grants expeditiously? Does the program have a schedule for the products it intends to produce and how well is it adhering to the schedule?

The committee's judgment is that quantitative metrics, although outwardly simpler to use, are not necessarily more informative than qualitative metrics. In some cases, quantitative metrics can be misleading, and emphasizing inappropriate metrics can distort the research outputs of a program. Qualitative metrics are less likely to have such effects, but they need to be interpreted carefully.

The committee judges that expert review by a group of people with appropriate expertise is the best method of evaluating broad research programs, such as the STAR program. Expert review is appropriate for evaluating both the processes and the products of the STAR program. The types of experts needed depend on the level of review being conducted—individual projects or programmatic levels. Both qualitative and quantitative metrics can provide valuable support for such expert reviews.

In planning for future reviews, the committee recommends that STAR and ORD consider an evaluation structure for the STAR program that has four levels: level 1 should examine the individual research projects, level 2 should focus on topics or groups of research projects on the same subject, level 3 should address the STAR program as a whole, and level 4 should tackle the question of how the STAR program relates to the broader institutions of ORD and EPA. The primary mechanism of review at levels 2-4 should be the panel of independent experts with the appropriate scientific, management, and policy backgrounds; the panels' evaluations can use metrics appropriate to the specific level of review. Such a structured review strategy could replace the number of ad hoc, unplanned, and uncoordinated reviews.

Recommendation. STAR and ORD should establish a structured program of reviews by panels of independent experts and should collect the appropriate information to support these reviews.

Attachment B

Summary of the PART program and process

What is the Program Assessment Rating Tool (PART)?

The PART is the latest executive branch initiative designed to better align spending decisions and program performance, often called "performance budgeting. The current statutory framework for performance budgeting is the Government Performance and Results Act, which became law in 1993. President George W. Bush announced his strong support for linking performance and budget, when he made it a major goal of the "President's Management Agenda." A key element in accomplishing this objective is the Office of Management and Budget's PART. The Administration views the PART as enabling more effective implementation of GPRA, and as aligned more closely with budgeting decisions than GPRA.

According to OMB, the PART is a diagnostic tool meant to provide a consistent approach to evaluating federal programs[7] as part of the budget formulation process. The PART, which is implemented by OMB's budget examiners, requires an examiner to answer 25 yes/no questions under four overarching categories. Each of the four categories is given a specific weight for determining an overall numerical score for each program. The categories and their weightings are: (1) program purpose and design (e.g., is the design clear and purpose sensible?) (20 percent); (2) strategic planning, (e.g., has the program set appropriate annual and long-term goals?) (10 percent); (3) program management, (is there sound financial and management oversight?) (20 percent); and (4) program results, (has the program is met its annual and long-term goals?) (50 percent). OMB asks a few supplementary questions, which vary depending on what type of program is under review, such as block grant, regulation, or R&D. Based on the total score, programs are rated as either effective, moderately effective, adequate, ineffective, or results not demonstrated.

OMB applied the PART to 234 programs in FY 2004 across all federal agencies, and plans to rate nearly 100 percent of all remaining programs over the next four years. Of the 234 programs, over 100 programs received ratings "results not demonstrated." According to a recent GAO study, discretionary programs that received effective scores tended to see budget increases and programs that received ineffective scores tended to receive budget decreases. For programs that received "results not demonstrated" scores, the budget story was more mixed. According to GAO, programs that received this score tended to indicate programs for which OMB and the Agency could not agree on appropriate performance measures.

[7] There is no standard definition of program, though it is intended to capture a set of activities clearly recognized as a program, having a discrete budget, or related to the level at which budget decisions are made.

Attachment C

United States General Accounting Office

GAO

Report to Congressional Requesters

January 2004

PERFORMANCE BUDGETING

Observations on the Use of OMB's Program Assessment Rating Tool for the Fiscal Year 2004 Budget

GAO-04-174

GAO
Accountability*Integrity*Reliability
Highlights

Highlights of GAO-04-174, a report to congressional requesters

January 2004

PERFORMANCE BUDGETING

Observations on the Use of OMB's Program Assessment Rating Tool for the Fiscal Year 2004 Budget

Why GAO Did This Study

The Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART) is meant to provide a consistent approach to evaluating federal programs during budget formulation. To better understand its potential, congressional requesters asked GAO to examine (1) how PART changed OMB's fiscal year 2004 budget decision-making process, (2) PART's relationship to the Government Performance and Results Act of 1993 (GPRA), and (3) PART's strengths and weaknesses as an evaluation tool.

What GAO Recommends

GAO recommends that OMB (1) address the capacity demands of PART, (2) strengthen PART guidance, (3) address evaluation information availability and scope issues, (4) focus program selection on crosscutting comparisons and critical operations, (5) broaden the dialogue with congressional stakeholders, and (6) articulate and implement a complementary relationship between PART and GPRA.

OMB generally agreed with our findings, conclusions, and recommendations and stated that it is already taking actions to address many of our recommendations.

GAO also suggests that Congress consider the need for a structured approach to articulating its perspective and oversight agenda on performance goals and priorities for key programs.

www.gao.gov/cgi-bin/getrpt?GAO-04-174.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Paul Posner at (202) 512-9573 or posnerp@gao.gov.

What GAO Found

PART helped structure OMB's use of performance information for its internal program and budget analysis, made the use of this information more transparent, and stimulated agency interest in budget and performance integration. OMB and agency staff said this helped OMB staff with varying levels of experience focus on similar issues.

Our analysis confirmed that one of PART's major impacts was its ability to highlight OMB's recommended changes in program management and design. Much of PART's potential value lies in the related program recommendations, but realizing these benefits requires sustained attention to implementation and oversight to determine if desired results are achieved. OMB needs to be cognizant of this as it considers capacity and workload issues in PART.

There are inherent challenges in assigning a single rating to programs having multiple purposes and goals. OMB devoted considerable effort to promoting consistent ratings, but challenges remain in addressing inconsistencies among OMB staff, such as interpreting PART guidance and defining acceptable measures. Limited credible evidence on results also constrained OMB's ability to rate program effectiveness, as evidenced by the almost 50 percent of programs rated "results not demonstrated."

PART is not well integrated with GPRA—the current statutory framework for strategic planning and reporting. By using the PART process to review and sometimes replace GPRA goals and measures, OMB is substituting its judgment for a wide range of stakeholder interests. The PART/GPRA tension was further highlighted by challenges in defining a unit of analysis useful for both program-level budget analysis and agency planning purposes. Although PART can stimulate discussion on program-specific measurement issues, it cannot substitute for GPRA's focus on thematic goals and department- and governmentwide crosscutting comparisons. Moreover, PART does not currently evaluate similar programs together to facilitate trade-offs or make relative comparisons.

PART clearly must serve the President's interests. However, the many actors whose input is critical to decisions will not likely use performance information unless they feel it is credible and reflects a consensus on goals. It will be important for OMB to discuss timely with Congress the focus of PART assessments and clarify the results and limitations of PART and the underlying performance information. A more systematic congressional approach to providing its perspective on performance issues and goals could facilitate OMB's understanding of congressional priorities and thus increase PART's usefulness in budget deliberations.

Results in Brief

The PART has helped to structure and discipline OMB's use of performance information for its internal program analysis and budget review, made the use of this information more transparent, and stimulated agency interest in budget and performance integration. Both OMB and agency staff noted that this helped ensure that OMB staff with varying levels of experience focused on the same issues, fostering a more disciplined approach to discussing program performance with agencies. Several agency officials also told us that the PART was a catalyst for bringing agency budget, planning, and program staff together since none could fully respond to the PART questionnaire alone.

Our analysis confirmed that one of the PART's major impacts was its ability to highlight OMB's recommended changes in program management and design. Over 80 percent of the recommendations made for the 234 programs assessed for the fiscal year 2004 budget process were for improvements in program design, assessment, and program management; less than 20 percent were related to funding issues. As OMB and others

recognize, performance is not the only factor in funding decisions. Determining priorities—including funding priorities—is a function of competing values and interests. Although OMB generally proposed to increase funding for programs that received ratings of "effective" or "moderately effective" and proposed to cut funding for those programs that were rated "ineffective," our review confirmed OMB's statements that funding decisions were not applied mechanistically. That is, for some programs rated "effective" or "moderately effective" OMB recommended funding decreases, while for several programs judged to be "ineffective" OMB recommended additional funding in the President's budget request with which to implement changes.

Much of the potential value of the PART lies in the related program recommendations and associated improvements, but realization of these benefits will require sustained attention to implementation and oversight in order to determine if the desired results are being achieved. Such attention and oversight takes time, and OMB needs to be cognizant of this as it considers the capacity and workload issues in the PART. Currently OMB plans to assess an additional 20 percent of all federal programs annually. Each year, the number of recommendations from previous years' evaluations will grow—and a system for monitoring their implementation will become more critical. OMB encouraged its Resource Management Offices (RMO) to consider many factors in selecting programs for the fiscal year 2004 PART assessments, such as continuing presidential initiatives and programs up for reauthorization. While all programs would eventually be reviewed over the 5-year period, selecting related programs for review in a given year would enable decision makers to analyze the relative efficacy of similar programs in meeting common or similar outcomes. We recommend that OMB centrally monitor and report on agency implementation and progress on PART recommendations to provide a governmentwide picture of progress and a consolidated view of OMB's workload in this area. In addition, to target scarce analytic resources and to focus decision makers' attention on the most pressing policy issues, we recommend that OMB reconsider plans for 100 percent coverage of federal programs by targeting PART assessments based on such factors as the relative priorities, costs, and risks associated with related clusters of programs and activities. We further recommend that OMB select for review in the same year related or similar programs or activities to facilitate such comparisons and trade-offs.

Developing a credible evidence-based rating tool to provide bottom-line ratings for programs was a major impetus in developing the PART.

However, inherent challenges exist in assigning a single "rating" to programs that often have multiple purposes and goals. Despite the considerable time and effort OMB has devoted to promoting consistent application of the PART, the tool is a work in progress. Additional guidance and considerable revisions are needed to meet OMB's goal of an objective, evidence-based assessment tool. In addition to difficulties with the tool itself—such as subjective terminology and a restrictive yes/no format—providing flexibility to assess multidimensional programs with multiple purposes and goals often implemented through multiple actors has led to a reliance on OMB staff judgments to apply general principles to specific cases. OMB staff were not fully consistent in interpreting the guidance for complex PART questions and in defining acceptable measures. In addition, the limited availability of credible evidence on program results also constrained OMB staff's ability to use the PART to rate programs' effectiveness. Almost 50 percent of the 234 programs assessed for fiscal year 2004 received a rating of "results not demonstrated" because OMB decided that program performance information, performance measures, or both were insufficient or inadequate. OMB, recognizing many of the limitations with the PART, modified the PART for fiscal year 2005 based on lessons learned during the fiscal year 2004 process, but issues remain. We therefore recommend that OMB continue to improve the PART guidance by (1) clarifying when output versus outcome measures are acceptable and (2) better defining an "independent, quality evaluation." We further recommend that OMB both clarify its expectations regarding the nature, timing, and amount of evaluation information it wants from agencies for the purposes of the PART and consider using internal agency evaluations as evidence on a case-by-case basis.

The PART is not well integrated with GPRA—the current statutory framework for strategic planning and reporting. According to OMB officials, GPRA plans were organized at too high a level to be meaningful for program-level budget decision making. To provide decision makers with program-specific, outcome-based performance data useful for executive budget formulation, OMB has stated its intention to modify GPRA goals and measures with those developed under the PART. As a result, OMB's judgment about appropriate goals and measures is substituted for GPRA judgments based on a community of stakeholder interests. Agency officials

we spoke with expressed confusion about the relationship between GPRA requirements and the PART process. Many view PART's program-by-program focus and the substitution of program measures as detrimental to their GPRA planning and reporting processes. OMB's effort to influence program goals is further evident in recent OMB Circular A-11 guidance[7] that clearly requires each agency to submit a performance budget for fiscal year 2005, which will replace the annual GPRA performance plan.

The tension between PART and GPRA was further highlighted by the challenges in defining a unit of analysis that is useful both for program-level budget analysis and agency planning purposes. Although the PART reviews indicated to OMB that GPRA measures are often not sufficient to help it make judgments about programs, the different units of analysis used in these two performance initiatives contributed to this outcome. For the PART, OMB created units of analysis that tied to discrete funding levels by both disaggregating and aggregating certain programs. In some cases, disaggregating programs for the PART reviews ignored the interdependency of programs by artificially isolating them from the larger contexts in which they operate. Conversely, in other cases in which OMB aggregated programs with diverse missions and outcomes for the PART reviews, it became difficult to settle on a single measure (or set of measures) that accurately captured the multiple missions of these diverse components. Both of these "unit of analysis" issues contributed to the lack of available planning and performance information.

Although the PART can stimulate discussion on program-specific performance measurement issues, it is not a substitute for GPRA's strategic, longer-term focus on thematic goals and department- and governmentwide crosscutting comparisons. GPRA is a broad legislative framework that was designed to be consultative with Congress and other stakeholders and allows for varying uses of performance information, while the PART applies evaluation information to support decisions and program reviews during the executive budget formulation process. Moreover, GPRA can anchor the review of programs by providing an overall strategic context for programs' contributions toward agency goals. We therefore recommend that OMB seek to achieve the greatest benefit from both GPRA and PART by articulating and implementing an integrated, complementary relationship between the two. We further recommend that OMB continue to improve the PART guidance by expanding the discussion

[7] OMB Circular A-11, *Preparation, Submission, and Execution of the Budget*, Section 220.

of how programs—also known as "units of analysis"—are determined, including recognizing the trade-offs, implications, or both of such determinations.

As part of the President's budget preparation, the PART clearly must serve the President's interests. However, experience suggests that efforts to integrate budget and performance are promoted when Congress and other key stakeholders have confidence in the credibility of the analysis and the process used. It is unlikely that the broad range of players whose input is critical to decisions will use performance information unless they believe it is relevant, credible, reliable, and reflective of a consensus about performance goals among a community of interested parties. Similarly, the measures used to demonstrate progress toward a goal, no matter how worthwhile, cannot appear to serve a single set of interests without potentially discouraging use of this information by others. We therefore recommend that OMB attempt to build on the strengths of GPRA and PART by seeking to communicate early in the PART process with congressional appropriators and authorizers about what performance issues and information are most important to them in evaluating programs. Furthermore, while Congress has a number of opportunities to provide its perspective on performance issues and goals through its authorization, oversight, and appropriations processes, we suggest that Congress consider the need for a more structured approach for sharing with the executive branch its perspective on governmentwide performance matters, including its views on performance goals and outcomes for key programs and the oversight agenda.

In commenting on a draft of this report, OMB generally agreed with our findings, conclusions, and recommendations. OMB outlined actions it is taking to address many of our recommendations, including refining the process for monitoring agencies' progress in implementing the PART recommendations, seeking opportunities for dialogue with Congress on agencies' performance, and continuing to improve executive branch implementation of GPRA plans and reports. OMB also suggested some technical changes throughout the report that we have incorporated as appropriate. OMB's comments appear in appendix IV. We also received technical comments on excerpts of the draft provided to the Departments of the Interior, Energy, and Health and Human Services, which are incorporated as appropriate.

Chairman EHLERS. Good morning. Welcome to today's hearing on the Environmental Protection Agency's Fiscal Year 2005 Science and Technology Budget. I will try to be brief with my opening statement so we can get right to the business of the day, and I will also note that Congressman Miller is here filling in for Congressman Udall, who is the Ranking Member.

The role of science in technology at EPA is more important than ever. EPA is being asked to address increasingly complex technical questions in its regulatory processes and in its search for emerging environmental problems. That is why I am surprised and concerned at the Administration's proposal to cut $22 million, which is nearly 12 percent, from EPA's science budget. It is hard to understand why, even in this tight budget time, the science budget would deserve such a substantial cut.

Today, the Subcommittee hopes to learn why the Administration proposes a cut of $35 million or 35 percent to EPA's competitive external research grants to colleges, universities and other researchers, as well as find out the impact of those reductions. This proposed cut is in the Science to Achieve Results grant program, affectionately referred to as STAR grant. It would mean less extramural research on ecological systems, pollution prevention, endocrine disrupters and mercury, among other topics.

Today, we are also interested in the understanding of the extent to which the Office of Management Budget's effort to assess the performance of governing programs under its new Program Assessment Rating Tool called PART led to these proposed cuts. As a strong supporter of linking performance to funding decisions, I look forward to a healthy discussion on how we can best evaluate environmental research and developmental programs. The PART is playing an increasingly important role in the Administration's budget decisions. It has been applied to hundreds of federal programs in the last two years and will be applied to the remainder over the next four. With this in mind, it is critically important for this Committee and the Congress overall to understand how this assessment tool is being used.

I would also like to mention my concern about the 8.3 million reduction the Administration proposes that would eliminate EPA's research on building decontamination. EPA has a unique role in cleaning contaminated buildings and it is not clear why this work is being cut, or whether another agency, such as the Department of Homeland Security, will pick it up. The full Science Committee plans to address this question further at our joint hearing with a select Committee on Homeland Security on March 25.

We have an excellent panel of witnesses today, and I expect that we will learn a great deal. I am looking forward to the testimony that we will hear.

The Chair now recognizes Congressman Brad Miller from North Carolina for an opening statement.

[The prepared statement of Mr. Ehlers follows:]

PREPARED STATEMENT OF CHAIRMAN VERNON J. EHLERS

Good morning. Welcome to today's hearing on the Environmental Protection Agency's fiscal year 2005 Science and Technology budget.

The role of science and technology at EPA is more important than ever. EPA is being asked to address increasingly complex technical questions in its regulatory

processes and in its search for emerging environmental problems. That is why I am surprised and concerned about the Administration's proposal to cut $92 million, which is nearly 12 percent, from EPA's Science budget. It is hard to understand why, even in this tight budget time, the science budget would deserve such a substantial cut.

Today, the Subcommittee hopes to learn why the Administration proposes a cut of $35 million, or 35 percent, to EPA's competitive, external research grants to colleges, universities and other researchers, as well as the impact of those reductions. This proposed cut is in the Science to Achieve Results grant program, affectionately referred to as STAR grants. It would mean less extramural research on ecological systems, pollution prevention, endocrine disruptors and mercury, among other topics.

Today, we are also interested in understanding the extent to which the Office of Management and Budget's effort to assess the performance of government programs under its new Program Assessment Rating Tool, called PART, led to these proposed cuts. As a strong supporter linking performance to funding decisions, I look forward to a healthy discussion of how we can best evaluate environmental research and development programs.

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We have an excellent panel of witness today and I expect that we will learn a great deal. I'm looking forward to the testimony.

Mr. MILLER. Thank you, Mr. Chairman.

I am pleased to be here this morning to open this hearing in Mr. Udall's absence. I am also very pleased to hear how much common ground there is between my views and those just expressed by the Chair.

I represent many of EPA's scientific staff who work at the Research Triangle Park in North Carolina. My interest, however, is more than parochial. I think I have the same interest in EPA's research and development funding that every American has or should have. In the 1960s, the Federal Government moved several air pollution-related environmental research facilities to the Research Triangle Park in North Carolina. This later evolved into a campus for the EPA, consisting of 400 laboratories. The laboratories focus on a wide range of research issues facing our nation, including air, health, exposure and environmental information. The Research Triangle is home to the EPA's largest operation outside of Washington, with a labor force of more than 2,500, and a $250 million annual contribution to North Carolina's economy.

You do not have to spend a lot of time on environmental issues to realize that they are very complicated and often very contentious. We have made great strides in balancing and recognizing the need to balance and in balancing economic development and environmental protection, and the ability to strike that balance is largely because of our investment in research and development. Protection of the environment is central to the protection of public health. Clean air and clean water are not luxuries. They are necessities. As a former member of the North Carolina legislature, I am very much aware of the problems caused by air pollution. Every

summer, air pollution causes 240,000 asthma attacks, 6,300 emergency room visits, and 1,900 hospital admissions in North Carolina. Almost one in five emergency room admissions in North Carolina is for pediatric asthma. That is a terrified parent taking their child to the emergency room because their child cannot catch their breath.

I will continue to work to improve that environmental health problem to protect North Carolina's children and North Carolina citizens against air pollution. I cannot reconcile the right to clean air and clean water and the constant call to base regulations and environmental policy on sound science with the Administration's budget request for this year for research and development at EPA. The request essentially guts R&D funding. From her written testimony, I understand that Dr. Matanoski of EPA's Science Advisory Board shares that opinion.

The Administration has requested cuts in research and development funding for EPA to about 12 percent below the appropriated level for this year. Now last year's request proposed a cut to EPA's Science and Technology accounts by almost five percent. The Administration is obviously going in the wrong direction.

The specific program cuts contained in this budget are unacceptable and difficult to understand. EPA's extramural grant program, which I believe the Chairman just mentioned, the Science to Achieve Results program, which has received high marks in external reviews by the Science Advisory Board and the National Academy of Sciences, is rewarded with a disproportionate cut of about one-third of its budget. During the same month, the Senate was closed due to contamination from ricin; this Administration released this budget terminating its research on building decontamination.

This budget request does not serve the needs of my constituents, I think the constituents of many on the Committee or in the Congress, or maintain a healthy research and development program within the EPA. If this is the result of applying the Office of Management and Budget's new budget evaluation tool, the PART, clearly, the tool is deeply flawed.

I do welcome our panel of experts, our witnesses, and I look forward to hearing your testimony today. Thank you.

[The prepared statement of Mr. Miller follows:]

PREPARED STATEMENT OF REPRESENTATIVE BRAD MILLER

I am pleased to be here this morning to open this hearing. I have the privilege of representing many of EPA's fine scientific staff that works at Research Triangle Park in North Carolina. As such, I have not only a general interest in EPA's research and development funding, but a hometown one as well.

In the 1960's, the U.S. government moved several air pollution-related environmental research functions to Research Triangle Park, North Carolina. This later evolved into a campus for the EPA consisting of 400 laboratories. The laboratories focus on a wide range of research issues facing our nation including air, health, exposure and environmental information. The Research Triangle is home to the EPA's largest operation outside of Washington with a labor force of more than 2,500, and a $250 million annual contribution to North Carolina's economy.

You don't have to spend much time on environmental issues to recognize they are contentious and complex. We have made great strides in balancing economic development and environmental protection because we have invested in research and development. Protection of the environment is central to the protection of public health. Clean air and clean water are not luxuries. They are necessities. As a former

member of the North Carolina legislature, I am acutely aware of the problems caused by air pollution. Every summer, air pollution causes 240,000 asthma attacks, 6,300 ER visits, and 1,900 hospital admissions in our state. I will continue to fight this environmental and health problem.

I cannot reconcile the right to clean air and water and the constant call to base regulations and environmental policy on sound science with the Administration's FY 2005 request for research and development at EPA. The request guts R&D funding. I note from her written testimony, that Dr. Matanoski of EPA's Science Advisory Board shares my opinion.

The Administration's request cuts research and development funding for EPA by about 12 percent below the appropriated level for this year. Last year's request proposed a cut to EPA's Science and Technology accounts by almost five percent. The Administration is going in the wrong direction.

The specific program cuts contained in this budget are unacceptable and difficult to understand. EPA's extramural grant program—the Science to Achieve Results program—which has received high marks in external reviews by the Science Advisory Board and the National Academy of sciences is rewarded with a disproportionate cut of about one third. During the same month the Senate was closed due to contamination from ricin, the Administration released this budget terminating its research on building decontamination.

This budget request does not serve the needs of our constituents or maintain a healthy research and development program with the EPA. If this is the result of applying the Office of Management and Budget's new budget evaluation tool—the PART—clearly this tool is deeply flawed.

I welcome our panel of witnesses and I look forward to hearing your testimony.

Chairman EHLERS. If there is no objection, all additional opening statements submitted by the Subcommittee Members will be added to the record. Without objections, so ordered.

I have to issue a correction. My staff said that I referred to the cut as $92 million in my opening statement. I referred to it as $22 million. It is actually $92 million. I hope that will be my only senior moment today, but I wanted to make clear that it is a very large amount of money.

At this time, it is my pleasure to introduce our witnesses. We are honored today to have with us Mr. Clay Johnson, the Deputy Director of Management at the Office of Management and Budget. We welcome you. It is good to see you in this role. I spent many times on the telephone with you in your first job in the personnel office, trying to recruit good scientists to work in the government and the Bush Administration, and it is a pleasure to see you in this role now, so thank you for coming.

Next, we have Dr. Paul Gilman, who is no stranger in this room. He has appeared here frequently. He is the Assistant Administrator for Research and Development at the United States Environmental Protection Agency, of course, always known by its acronym EPA.

Next, Mr. Paul Posner. Is it Posner or Posner? Posner. Posner. Sorry. Mr. Paul Posner is the Managing Director for Budget and Intergovernmental Relations at the General Accounting Office, which we all know by GAO. He offers—oversaw GAO's recent report on how PART is being implemented.

Next, we are pleased to have Dr. Matanoski, who is a Professor in the Department of Epidemiology at Johns Hopkins University. She also chaired the EPA Science Advisory Board Review of EPA's Fiscal Year 2005 Budget. While I introduce Dr. Matanoski, I would also like to recognize Dr. William Glaze, who is the current chair of EPA's Science Advisory Board, who has helped lead the budget.

And finally, Dr. Denson is a Professor in the Department of Engineering at the University of Delaware. He is also a Member of

the National Academy of Science's Panel that reviewed the EPA's Science to Achieve Results Research Grants Program, better known by its acronym STAR. And now I would like to introduce not only the witnesses, but all the acronyms. We can soon proceed to the testimony. Our witnesses I presume have been informed that spoken testimony is limited to five minutes each, after which the Members of the Committee will have five minutes each to ask questions. If you cannot complete your statement, obviously, your written statement will go in the record. If you do not feel you have had a chance to say everything you wanted to say in your opening oral statement, you will have ample opportunity during the questions to raise any points you believe should be raised.

At this point, we will open our first round of questions. The Chair recognizes himself for five minutes. Oh, I am sorry. That is my second senior moment. It is a bad day today. I was ill last night, but that is no excuse. A Member of the Minority wants me to lose count. I suppose he would like me to forget who is the minority here too. Okay. We will start with Mr. Johnson.

STATEMENT OF MR. CLAY JOHNSON, III, DEPUTY DIRECTOR OF MANAGEMENT, OFFICE OF MANAGEMENT AND BUDGET

Mr. JOHNSON. Mr. Chairman, Mr. Miller, thank you for having me.

We, all of us, are interested and working very hard to make the Federal Government results oriented, and I would suggest, Mr. Miller, that in fact, we are hitting in the right direction, not the wrong direction. The right direction is let us pay attention to the results we are getting for the money we are spending, and not how much money we are spending. And I think this is your interest and our interest as well, as I think this is the direction that in fact the Federal Government is heading.

EPA is one of the leaders in the Federal Government at focusing on results. They are particularly strong in the financial management area in the way we keep score, the score card. They are one of the few agencies that have achieved green, which just means they are using accurate and timely financial information with which to make regular, frequent management decisions. So they are one of the agencies we are very, very proud of in terms of the accomplishments they have made.

We are here to talk about two things, as I understand it. One of them is the PART and one of them is the specific decision that has been with regard to ecological research and the Pollution Prevention Program. The PART helps agencies look at their programs with consistency. I would suggest that it is a valuable tool now. I believe this is GAO's assessment of the program, and it is a tool that will get—it is a device that will get better every year. There is nothing magic about the PART. There is nothing sacrosanct about the 25 or 30 questions we ask. What is magic about it is it is a device now that will get better over time that—with which we can look at programs and ask ourselves key management structure and results, questions about programs in a consistent fashion, and focus more and more with increasing proficiency as to what we are getting for our money. Nothing happens automatically, as a result of a PART evaluation, but the information that comes out of the

PART assessment is used to help inform decisions about how to better manage, better structure, and better fund programs, including research programs.

The two programs in particular that are the primary focus of this hearing, the Ecological Research and Pollution Prevention Programs, were assessed with the use of the PART. They were considered to be less results-oriented than they could be or than other programs of a similar nature. In fact, EPA's Prevention, Pesticides and Toxics Program were considered to be most results-oriented, and in fact, the money that is recommended not be spent, the reductions that were recommended for these two programs in fact is being put in this other program, where the belief is that the return for the taxpayer on the $30 million will be greater than it would be if it was spent in the other programs. These two programs are well-funded at the recommended 2005 levels. They are reasonably well-funded programs. Therefore, we believe we do not significantly impair the focus of these research programs with these reductions, but we do produce a greater return for the taxpayer.

The PART was used to inform this budget proposal, but there was nothing automatic that flowed out of this PART assessment. These programs were not as results-oriented as they could be, or we thought should be. The other obviously major part that went in this funding recommendation was the very tight fiscal situation we find ourselves in, trying to produce very, very tight budgets, not related to Homeland Security and Defense. But I look forward to your questions later on. Thank you.

[The prepared statement of Mr. Johnson follows:]

PREPARED STATEMENT OF CLAY JOHNSON, III

Introduction

Thank you, Mr. Chairman, Members of the Committee, for inviting me to testify this morning. I want to discuss with you our assessment of the Environmental Protection Agency's (EPA) research programs and describe how the President's Management Agenda helps federal agencies get greater results on behalf of the American people.

We, all of us, are in the process of making the Federal Government results-oriented. We here in Washington tend to focus on the amount of money we're spending as a validation for how much the Federal Government is committed to an objective. As a part of becoming results-oriented, however, we are now focusing more heavily on the results we achieve on behalf of the American people. With just a little help from OMB, agencies are asking whether they are achieving their objectives as effectively and efficiently as possible. EPA is a leader in this effort.

EPA is as advanced as any agency in government in having and using accurate financial information to make day-to-day decisions about program management. For example, EPA negotiates performance commitments with its grantees and provides resources based on those commitments. EPA regularly monitors grantees' performance and expenditures and, if a grantee isn't meeting its commitments, EPA may withhold resources from the non-performers and redirect those resources to grantees that are meeting their commitments.

The Program Assessment Rating Tool

Applying the Program Assessment Rating Tool (PART) is one of the ways we are becoming results-oriented. The PART is a series of questions that assesses the purpose, strategic planning, management, and performance of individual programs. Programs must demonstrate that their purpose is clear, that they set aggressive, outcome-oriented long- and short-term goals, that they are well managed, and that they achieve results. With this tool, we are assessing the performance of every federal program, and if it is not working as intended, we are trying to do something about it.

The Administration has used the PART to assess 400 programs so far, representing approximately $1 trillion in federal spending. We are using these assessments not only to guide our budget decisions, but also to improve the performance and management of the government's programs. The purpose of asking whether programs are working is to figure out how to fix them, not whether to spend more or less on them.

Ecological Research and Pollution Prevention PARTs

As you know, OMB and EPA assessed EPA's Ecological Research program and Pollution Prevention and New Technologies program using the PART. According to the assessment, the Ecological Research program:

- did not adequately coordinate the expenditure of resources with other EPA offices or other agencies;
- lacks adequate annual measures of its performance; and
- does not have sufficient evaluations of its performance.

Like nearly 40 percent of the programs evaluated using the PART, the principal finding for the program was the lack of adequate performance measures. Therefore, EPA has committed to finding the right measures for this important program. The President has requested $110 million for this program in his FY 2005 Budget, down from $132 million in FY 2004.

According to the assessment, the Pollution Prevention and New Technologies program:

- has not addressed findings made by independent evaluations; and
- has not developed adequate measures of its performance.

As a result of these findings, EPA has committed to developing adequate performance measures and addressing findings made in previous independent evaluations. The President has requested $36 million for this program in his FY 2005 Budget, down from $42 million in FY 2004.

Why reduce funding for these programs?

Both the Ecological Research and Pollution Prevention programs were "unable to demonstrate results," which clearly influenced funding decisions related to the programs. Especially in a year like this one, when resources are constrained, we should be directing resources to those programs that can achieve the most for the money. EPA and OMB used the PARTs for the Ecological Research and Pollution Prevention programs as one factor in making budget decisions about those programs and to focus resources on the programs most effective in helping EPA accomplish its mission.

As I've mentioned, the Pollution Prevention research program could not show whether the tools it is developing are used by industry, and, if so, to what extent they are used. Also, previous independent evaluations of the Pollution Prevention research program concurred with the PART review, especially in the areas of strategic planning and measurable results. On the other hand, a similar program in the EPA's Office of Prevention, Pesticides, and Toxics was able to show that industry reduced its use and emissions of toxic chemicals through the use of tools and methods developed by the program. We consider reductions in pollution to be one of the highest-level outcomes of an environmental program's performance. Therefore, we redirected funds to the pollution prevention program so EPA can continue to achieve pollution reduction, thereby positively impacting the quality of public health and the environment. Despite redirection of a small amount of funds from pollution prevention research to OPPTS's program, the Administration maintained a large amount of funding for the pollution prevention research program to assist it, among other things, in developing performance measures.

This is our rationale for funding decisions related to EPA's research programs. I will leave to Dr. Gilman a more robust discussion of how these funding decisions were applied to specific components of the research programs.

Research and Development and the Investment Criteria

The Government's investment in research & development, not only in the environmental arena but elsewhere, is substantial. But in a time of constrained resources, it is imperative that we invest in R&D wisely. In recognition of the special challenges that measuring R&D programs present, and leveraging work done by the National Academies of Science, the Administration developed its R&D Investment Criteria, which were incorporated into the PART. These criteria are some of the things we look at when assessing the value of particular R&D programs:

- Relevance. Programs must be able to articulate why they are important, relevant, and appropriate for federal investment;
- Quality. Programs must justify how funds will be allocated to ensure quality; and
- Performance. Programs must be able to monitor and document how well the investments are performing.

As noted in our PART evaluations, the programs we assessed could improve the ways they measure their performance. The three EPA programs we assessed cover important issues, and receive funding totaling approximately $210 million. We strongly believe that programs with federal funding of this magnitude should be able to monitor and document how these investments are performing. There are other equally important programs that are receiving similar levels of funding, but whose results are more measurable. For example, the Department of Energy's Wind Energy program, with proposed FY 2005 funding of $42 million, can demonstrate its contributions to the commercial success of wind energy use throughout the United States. The Federal Aviation Administration's Research, Engineering and Development program, with proposed FY 2005 funding of $117 million, has set a long-term goal to produce turbulence forecasting products that allow pilots to avoid hazardous flight conditions while improving safety and ensuring efficient airspace use.

The Future of the PART

The PART is a vehicle for improving program performance. It is just a tool to achieve the goals laid out by Congress in the Government Performance and Results Act (GPRA). GAO has made a number of recommendations for improving the PART, the vast majority of which we agree with and are addressing. For example:

- With respect to centrally monitoring PART recommendations, we have provided a simple format for agencies to follow when reporting the status of recommendation implementation to OMB and I receive these reports semi-annually. We will continue to refine this process so that sufficient attention is given to recommendation follow-up.
- As the PART relies on separate evaluations of evidence of a program's success, we agree with GAO that the judgment about what constitutes a sufficient evaluation should be based on the quality, in addition to the independence, of the evaluation.
- One of the greatest opportunities for the PART is to compare the performance of, and share best practices among, like programs across government. We will continue to use the PART for that purpose.
- We will continue to improve agency and Executive Branch implementation of GPRA by insisting GPRA plans and reports meet the requirements of this important law and the high standards set by the PART.
- We are clarifying the PART guidance so that it is well understood by those who have to use it, as well those who have to administer it. We will continue to assess completed PARTs to ensure they are completed consistently by agencies and OMB.

Conclusion

The PART is a valuable tool now, as the General Accounting Office and others have asserted, and it will get better each year. As more and more program assessments are conducted, the vast majority of budget and management decisions will be significantly influenced by information about how programs are performing. Agencies, including EPA, will be better able to describe to Congress and the taxpayer what his or her funding is purchasing and will be managing so that each year improvements in efficiency and service delivery can be documented.

BIOGRAPHY FOR CLAY JOHNSON, III

Clay Johnson is the Deputy Director for Management at the Office of Management and Budget. The Deputy Director for Management provides government-wide leadership to Executive Branch agencies to improve agency and program performance. Prior to this he was the Assistant to the President for Presidential Personnel, responsible for the organization that identifies and recruits approximately 4,000 senior officials, middle management personnel and part-time board and commission members.

From 1995 to 2000, Mr. Johnson worked with Governor George W. Bush in Austin, first as his Appointments Director, then as his Chief of Staff, and then as the Executive Director of the Bush-Cheney Transition.

Mr. Johnson has been the Chief Operating Officer for the Dallas Museum of Art and the President of the Horchow and Neiman Marcus Mail Order companies. He also has worked for Citicorp, Wilson Sporting Goods and Frito Lay.

He received his undergraduate degree from Yale University and a Master's degree from MIT's Sloan School of Management. In Austin, he helped create the Texas State History Museum, and was also an Adjunct Professor at the University of Texas Graduate School of Business. In Dallas, he served as President of the Board of Trustees for St. Marks School of Texas, and as a Board Member of Equitable Bankshares, Goodwill Industries of Dallas, and the Dallas Chapter of the Young Presidents Organization.

Chairman EHLERS. Thank you.

Dr. Gilman.

STATEMENT OF DR. PAUL GILMAN, ASSISTANT ADMINISTRATOR FOR RESEARCH AND DEVELOPMENT, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Dr. GILMAN. Thank you, Mr. Chairman, Members of the Committee. Thanks for the opportunity to be here. I am here as the Assistant Administrator for the Office of Research and Development. I also serve as Science Advisor for the Agency.

The Office of Research and Development is a service element to the various programs of the Agency. It does both basic and applied research. Roughly half basic, half applied. It does research in human health, public health and environmental and ecological sciences. Again, approximately a 60/40 split, in terms of human health and environmental health. There is a great emphasis on quality in the research program. It ranges from the very earliest stages of planning. We have instituted a planning process that develops multi-year plans for each of the major research areas. Those plans are developed in collaboration with our customers, if you will, the various programs of the agency; water, air, land, and coordinated with other federal agencies and outside entities, as well.

We have gone from an Agency that was viewed as a laggard in the use of peer-review to, I think today, an agency viewed as a leader in the use of peer-review, and the Extramural Grants Program, as you will hear later from the witness representing the National Research Council, is a well-respected program as well. We place a great emphasis on collaborative research with other federal agencies in order to stretch our dollars and to avail ourselves of their expertise. Probably a very good example of that collaborative effort is a report we just released two days ago on the health of our nation's coastal waters, where we collaborated with 28 different states, a number of federal agencies; NOAA, Department of Interior, Agriculture, to really produce the first scientifically supportable assessment of the quality of coastal waters that we have had in a comprehensive way.

The programs of particular matter, ecological research and pollution prevention all have tough goals set for them by our Agency, and embedded in our multi-year plans. Like providing the data and tools to predict, measure, reduce and meet the standards for particulate matter, as well as producing that report I just mentioned on the coastal health of our ecosystems. Yet, we are still challenged to provide measures that truly get into the performance of those

programs. I am committed to working with the Office of Management and Budget and others to create long-term annual and efficiency measures that capture the important work our programs are doing. In the end, these measures will help advance our programs by demonstrating the value of our achievements very clearly.

Let me say something about some recent accomplishments to demonstrate the breadth of the work that we are doing. These goals and accomplishments all draw on the STAR program that is the subject of this hearing. We have recently done work that is directly applicable to protecting water quality, a mission for the Agency, that also has Homeland Security implications towards better understanding of how water distribution systems actually work, not the pre-treatment but the post-treatment side of the water system. We are working to improve our air models, to improve their performance and their accuracy. We are working to develop DNA-based technologies for the identifications of things like common household molds that are deleterious to our health. And a development like that is the kind of thing we are very proud of because we are in the process of licensing it to a number of companies, with over 15 companies licensing that particular technology.

Again, Mr. Chairman, it is a challenge for us to relate the results of our research on inherently long-term research to measures for environment and public health outcomes. We are committed to doing it. We have been trying to develop some approaches in collaboration with our Inspector General. We are also very interested in continuing our discussions with the Office of Management and Budget to utilize some different approaches to the evaluation of these programs, and I think they will prove to be effective.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Gilman follows:]

PREPARED STATEMENT OF PAUL GILMAN

Introduction

Good morning Mr. Chairman and Members of the Subcommittee. I am honored to appear before you today to discuss the Fiscal Year (FY) 2005 budget request for the U.S. Environmental Protection Agency's (EPA) Office of Research and Development (ORD), and to share with you the uniqueness and success of ORD's research program from my perspective as both the Assistant Administrator for ORD and the EPA Science Advisor.

The President's FY 2005 budget request for ORD is $572.2 million. This includes funding for ORD's in-house program carried out by 1,975 employees, who account for 11 percent of EPA's workforce. In addition, the budget request supports our Science to Achieve Results (STAR) research grants program. Together, our in-house and STAR programs allow our nation's brightest scientists to apply their talents and knowledge to solve environmental science problems. My testimony highlights the contributions we and our partners have made and describes changes to the Agency's research budget for STAR research in FY 2005.

ORD's Unique Contributions

ORD conducts leading-edge research and fosters the use of science and technology in environmental decisions in support of EPA's mission to protect human health and safeguard the environment. This research tackles problems to which solutions will have both immediate and long-term public health and environmental benefits. The advancement of science and the development of answers to questions posed by environmental issues makes ORD unique among federal research agencies. No other federal agency has a comprehensive research program devoted to improving our understanding of both public health and environmental impacts. No other agency is researching these issues in an integrated fashion. In addition, no other agency can claim as large an impact on ensuring EPA's decisions are informed by the strongest possible science. To further strengthen our science program, EPA has been imple-

menting the National Research Council (NRC) recommendations in its 2000 report, "Strengthening Science at the U.S. Environmental Protection Agency: Research Management and Peer Review Practices," as I will describe below. In sum, ORD is conducting leading-edge research that informs the risk-based environmental decision-making of EPA's program and regional offices and helps States and Tribes decide how best to implement these policies.

Ensuring these decisions are based on sound science requires *relevant, high quality, integrated, leading-edge research* in human health, ecology, pollution prevention and control, and socio-economics. To maintain both short- and long-term *relevance* to EPA's mission, ORD's scientific research activities are mainly focused on applied research, which is problem-driven and, to a lesser extent, basic research. To ensure the *quality* of our research program, ORD uses a coordinated, cooperative research planning process; rigorous, independent peer review; and interagency partnerships and extramural grants to academia that complement EPA's own in-house scientific expertise. We have a uniquely *integrated* research program in that we address both human and ecological endpoints, conduct research across the risk assessment/risk management paradigm, have expertise across scientific disciplines and within the different environmental media, and draw from expertise in other agencies, organizations, and academia. Lastly, ORD keeps a *leading edge* in research by focusing our efforts and resources on those areas where EPA can add the most value toward reducing uncertainty in risk assessments and enhancing environmental management.

The following are a few examples of our more recent accomplishments. ORD researchers:

- Collaborated with the Department of Homeland Security, Department of Energy, Department of Defense, and Centers for Disease Control to strengthen water security, develop rapid risk assessment techniques, and develop building decontamination methods.
- Partnered with 24 marine coastal States, four territories, and other federal agencies through the Environmental Monitoring and Assessment Program's National Coastal Assessment, to conduct sampling of estuaries using probabilistic methods.
- Collaborated with EPA's Office of Environmental Information to deliver the draft Report on the Environment, the first-ever national picture of U.S. environmental quality and human health using science-based indicators.
- Developed the Computational Toxicology Program, which has moved EPA to the leading edge in the use of genetics, genomics, and computation for environmental protection.
- Completed an evaluation of Superfund clean-up technologies citing 143 successfully demonstrated technologies and $2.6 billion in total inflation-adjusted cost savings.
- Continued our tradition of leadership in the use of external scientific expertise to enhance the quality and relevance of our scientific products, by relying on the processes of peer participation and peer review.

I am proud of these accomplishments and the others I will identify later. They are the direct result of careful research planning that relies on the active involvement of the Agency's program and regional offices, as well as outside peer input.

Research Planning

The President's budget request for FY 2005 will allow us to build upon these accomplishments by continuing a research program that directly serves EPA's mission. EPA's science and technology efforts are aligned with the Agency's strategic goals, and we now have gone a step further by including science objectives within each of EPA's five strategic goals. ORD created these science objectives in collaboration with EPA's program and regional offices, to ensure that we produce the right scientific and technical information to meet EPA's programmatic needs and thereby advance the Agency's mission.

The alignment of our science and technology program with EPA's strategic goals is carried forward into ORD's planning of our research and development program. We have divided our R&D program into topical areas, each of which is guided by a multi-year research plan (the plans can be found at *www.epa.gov/osp/myp.htm*). Each multi-year plan contains long-term research and development goals for the next 5–10 years that tie back to EPA's strategic goals, and are supported by annual performance goals and measures. Every multi-year plan, and the goals and measures that comprise the plan, is developed in concert with colleagues across EPA and in consultation with our stakeholders and the broader scientific community. The plans also undergo expert, external peer review by EPA's Science Advisory Board

(SAB) and ORD's Board of Scientific Counselors (BOSC). Both groups have endorsed this research planning process.

The multi-year plans are "road maps" that mark the progress our research programs have already made, as well as lay out the new directions we are taking to adjust as changes occur in the complex scientific landscape ahead. Developing this road map requires identifying a logical progression of scientific research to be contributed by EPA and its partners. This progression is defined in each multi-year plan using "logic models" that demonstrate how research results contribute to EPA's desired long-term outcomes of improved human and ecosystem health. By following the logic diagram, one can begin to see how each research project contributes to the achievement of the long-term outcome. For illustration purposes, I have attached the logic diagram from our Particulate Matter (PM) multi-year plan. I discuss logic models in greater detail later in this testimony.

The multi-year research plans help EPA maintain its focus on high-priority science issues. They also assist in coordinating research efforts across the environmental science community, including other federal entities; State, tribal, and local governments; international organizations; and academia. Such coordination is essential. EPA's science and technology budget is only a small fraction of the total annual expenditures on environmental research, so leveraging our efforts with others—and, most important, identifying the appropriate niche for EPA's science and technology programs—is necessary for our doing the right science in a fiscally responsible manner.

Independent scientific bodies have lauded EPA's process for planning its research efforts. In its 2000 publication, *Strengthening Science at the U.S. Environmental Protection Agency,* the National Research Council stated, "Our committee expects that ORD's recent efforts in multi-year planning will contribute greatly to research program continuity and the achievement of strategic goals, and ORD merits commendation for these initiatives." Four years later, I can state with confidence that our research planning process is meeting—and perhaps exceeding—the NRC's expectations.

I wish to discuss two of our research programs—airborne particulate matter and ecosystem protection—to illustrate how EPA's science complements the scientific work of others, to advance scientific understanding and inform the decisions that solve environmental problems. Both of these research programs were evaluated using the Program Assessment Rating Tool (PART). The principles and practices applied in the particulate matter and ecosystem protection programs are those used in each of EPA's research and development programs.

Particulate Matter

Among the most serious environmental problems affecting the health of Americans is exposure to airborne particulate matter. Based on the best science available to us, these exposures contribute to the premature deaths of tens of thousands of Americans annually, as well as the hospitalization of children and adults for diseases such as asthma. This has been documented in the Office of Management and Budget's (OMB) "Thompson Report" (68 Fed. Reg. 5492, 5499 (2003)). To protect the public against these effects, the Clean Air Act calls for the promulgation and periodic review of National Ambient Air Quality Standards, or NAAQS. In the late 1990s, after such a review yielded new standards for fine PM (particles less than 2.5 microns in diameter), Congress authorized and appropriated funds to EPA for a greatly expanded PM research program, to be guided by advice from the National Research Council. I would like to describe how we have organized this program and share what we have learned.

To deliver the best science needed to inform sound public policy decisions, we have worked with our Agency partners in the Office of Air and Radiation and the regions to develop a multi-year plan for PM research that looks forward a little more than a decade. This plan, which will be peer reviewed by the EPA Science Advisory Board later this year, describes research activities in two major areas: (1) PM health effects and exposure, to guide future reviews of the NAAQS to refine the type and amount of PM that needs to be controlled to protect public health; and (2) implementation tools, so that EPA, the States and the tribes, and the private sector can ensure that these standards are met.

The PM multi-year plan integrates the strengths of our in-house scientists with those of the external scientific community, through the extensive use of our STAR research grants program, including the support of five PM Research Centers. In addition, EPA's researchers are coordinating their efforts with others in the public and private sectors, both domestically and internationally. For example, health research is being conducted overseas by several organizations, while in the United States, studies are being supported by industrial organizations including the Electric Power

Research Institute and the Coordinating Research Council through their support of the Health Effects Institute (co-funded by EPA). Recently, EPA, the National Institute of Environmental Health Sciences, and the National Heart, Lung, and Blood Institute co-sponsored a workshop on the cardiovascular effects of environmental pollutants, and planning is now underway to develop joint Requests For Applications in the area of cardiovascular effects of PM exposure. Through these and other mechanisms, EPA contributes to and keeps abreast of the scientific advancements and initiatives in the PM area.

What have we learned since the setting of the 1997 NAAQS? Here are a few examples:

- In 1997, questions were raised about the legitimacy of findings showing associations between centrally-monitored PM and health effects. We now understand that these monitors actually do a good job at estimating population exposures, which has lent further credence to the health associations found in epidemiologic studies.
- While we knew of these associations between PM and increased mortality in 1997, we were at something of a loss to explain them biologically. Due to work done by both ORD in-house and STAR-supported extramural scientists, we now have several plausible hypotheses for the biological mechanisms leading to those associations, including recent findings showing an effect of PM directly on the heart.
- In 1997, we had a poor understanding of the chemical composition and size distribution of PM that correlated with health effects. Today, we have detailed profiles of the PM associated with many significant sources and geographic areas, and we continue to refine our understanding about the specific types of sources responsible for these public health risks.

While EPA's PM research program has been a success, there continues to be more to learn, as described in the PM multi-year plan. One focus of the program in the coming years will be to integrate the methods of diverse disciplines to determine the specific types of PM, and their sources, that have the greatest effect on public health. This will allow future standards and control strategies to focus attention only on those sources of pollution that need to be addressed. Another major focus will be on understanding the effects of long-term exposures to PM, through the funding of a long-term epidemiologic study to be conducted as part of our STAR research program. Lastly, EPA will evaluate new technologies for reducing air pollution, examining the ability of controls to reduce emissions of many pollutants at once. The results of these efforts will inform EPA's future PM policies, to ensure these policies protect human health in the most effective ways.

Ecological Research

Current ecological management approaches have made important contributions to improved environmental quality through greatly reducing emissions of pollutants from point sources and waste disposal sites, and reducing the mishandling of toxic or hazardous chemicals and pesticides. Future ecological problems, however, will likely be more subtle, potentially more far-reaching, and require very different solutions. Examples include non-point source pollution control, regional-scale effects of air pollutants on aquatic ecosystems, dislocations in ecologically and economically important species due to invasions by non-indigenous species, and the cumulative effects and synergistic interactions of multiple stressors on the health of aquatic species and communities.

To deliver sound science for informed decision-making, EPA has focused its ecological research program to assess and compare risks to ecosystems, to protect and restore them, and to demonstrate progress in terms of ecological outcomes. The ecological research program also reflects the growing ethic of environmental stewardship and the recognition that the implementation of these ecological management approaches will be largely community and sector-based, place-based, and performance-based.

Environment and natural resource research is coordinated government-wide through the Committee on Environmental and Natural Resources (CENR). EPA is an active member on this committee, whose goal is to increase the overall effectiveness and productivity of federal research and development in environmental issues. Given the current fiscal constraints, EPA believes it is more important than ever for federal agencies to collaborate and coordinate research activities. EPA has a long history of collaborating ecosystem research with the National Science Foundation. EPA plans to continue, and wherever appropriate enhance, its coordination with NSF and other agencies.

ORD's Ecological Research Strategy underwent interagency peer review by the CENR in June 1997, and external review by the Science Advisory Board's Ecological Processes and Effects Committee in July 1997. The final Strategy, published in June 1998, formed the basis for ORD's Ecological Research Multi-Year Plan, which describes how the Agency plans to align its resources to achieve the plan's goals, including the integration of ORD's in-house research efforts with those conducted by our STAR research grants program.

The Ecological Research Multi-Year Plan lays out four critical scientific questions to be addressed and their associated research emphases and programmatic goals. These questions are:

- What is the current condition of ecosystems and what are the trends in their condition over time? (Assessing condition)
- How do natural ecological disturbances and human activities affect ecosystems? How can we most accurately diagnose the causes of ecosystem deterioration? (Diagnosis)
- How can we reliably predict the vulnerability of ecosystems to harm from current resource development and management practices? How can we predict the most probable responses of ecosystems to best management and sustainable development practices? (Forecasting)
- How can we most effectively control risks and manage to protect ecosystems once they have been degraded? (Restoration)

The PART evaluation on the ecological research program found that the program addresses a clear and continuing need and that it is generally well-managed, with adequate grantee and resource oversight. Its work has lead to accomplishments such as the Environmental Monitoring and Assessment Program (EMAP) National Coastal Assessment accomplishments that I mentioned earlier. Additional examples include:

- Research methods and findings from ORD's EMAP have enabled State and tribal water monitoring programs to obtain more reliable data on the ecological condition of their streams and rivers, at significantly lower cost than the methods they had been using.
- ORD produced national guidelines on assessing ecological risks. For the first time, these guidelines extend the principles of EPA's risk assessment paradigms to assessing and comparing risks to ecosystems.
- STAR researchers have developed and applied integrated methods to model and evaluate the effect of stressors on water quality. These include development of models to: (1) estimate annual nutrient loading to Lake Tahoe from atmospheric deposition, precipitation, stream discharge, overland runoff, groundwater and shoreline erosion; (2) estimate how "build-out" in urbanizing watersheds affects nutrient cycling, water quality, and the ecological health of rivers and streams in Gwynns Falls, Maryland; (3) evaluate the effects of agricultural best management practices on stream flow, sediment, and nitrate loadings in the lower Minnesota River; and (4) contaminant loading and bioaccumulation in Lake Erie.

As described in the Ecological Research multi-year plan, however, we are committed to building upon these achievements, and in the future, the ecological research program will focus heavily on diagnosis, forecasting, and restoration research. This research will enable the Agency to implement performance oriented, place-based protection of ecological systems. Our challenge now is to translate these successes into performance measures that demonstrate the utility of the tools and other protocols that we develop. In particular, long-term goals are difficult for any environmental program to develop, even more so for an environmental research program. I am committed to working with OMB and others to create long-term, annual, and efficiency measures that capture the important work our program is doing. In the end, these measures will help advance our program by demonstrating the value of our achievements.

Science Quality Across EPA

While our comprehensive and collaborative research planning process guides EPA to do the right science, as EPA's Science Advisor, I believe EPA's integrated approach to scientific quality makes sure that we also *do the science right,* not only in ORD but across the Agency. The three pillars of this approach are our Quality System, Information Quality Guidelines, and Peer Review Policy.

EPA's Quality System is the means by which we manage our scientific information in a systematic, organized manner. It provides a framework for planning, im-

plementing, and assessing the scientific work performed by EPA and for carrying out quality assurance and quality control activities. Each EPA organization develops a quality management plan that describes its quality system in terms of the organizational structure, policy and procedures, functional responsibilities of management and staff, lines of authority, and necessary interfaces for the planning, implementing, documenting, and assessing of all activities conducted. At the individual project level, we develop quality assurance project plans that describe the necessary quality assurance, quality control, and other technical activities that must be implemented to ensure that work outputs will satisfy the stated performance criteria. The goals of the EPA Quality System are to ensure that environmental programs and decisions are supported by data of the type and quality needed and expected for their intended use, and that decisions involving environmental technology are supported by appropriate quality-assured engineering standards and practices.

EPA recognizes that the Office of Management and Budget's Information Quality Guidelines, together with our own Information Quality Guidelines issued in October 2002, are an important step forward in the quest for quality. The OMB guidelines call for all federal agencies to develop quality performance goals, including procedures to assure quality before information is disseminated. In response to these guidelines, EPA has established a system for addressing complaints about the quality of information that the Agency has disseminated. We now have more than a year's worth of experience in addressing challenges to EPA information under the guidelines, and this experience has validated our belief that ensuring the quality of our scientific information is paramount to maintaining the integrity of, and the public's confidence in, EPA's policies and decisions.

Consistent Agency-wide application of independent, expert scientific peer review has been an EPA priority for many years. Since issuing our peer review policy in 1993, we have taken several major steps to support and strengthen the policy. But proof of a policy's value lies in its implementation, and here also EPA has been very active to ensure that our peer review policy is not only understood across the Agency, but is *applied* rigorously across EPA's program and regional offices. EPA has in place a strong and extensive program for peer reviewing our scientific and technical work products.

EPA's approach to peer review is articulated in our policy, *Peer Review and Peer Involvement at the U.S. Environmental Protection Agency.* In addition to the policy, EPA has published a handbook that provides detailed guidance for implementing the policy. The *Peer Review Handbook* can be found at *www.epa.gov/osp/spc/2peerrev.htm.* We believe this is one of the most advanced treatments of peer review for intramural research and scientific/technical analysis of any federal agency.

Most of EPA's scientific and technical work products now undergo peer review. In 1995, the Agency identified 120 work products for peer review. In 2002, of 859 work products generated by or for EPA, only 111 were deemed, usually because of their repetitive or routine nature, not to be candidates for peer review. So, we see that nearly 90 percent of our scientific and technical work products receive internal or external peer review. And 90 percent of those peer-reviewed products received independent, *external* review.

We were confident enough in the strength of our peer review program that we made it a cornerstone of our Information Quality Guidelines. Since issuing our policy ten years ago, peer review has become a part of EPA's culture, and its use is widespread across the Agency. Our challenge for the future is to continue the significant progress we have achieved to date and, not being content with the status quo, to look for ways to enhance the use of peer review as a tool for ensuring that EPA's decisions are supported by a firm foundation of scientific and technical information.

Doing the right science through forward-looking collaborative research planning, and *doing the science right* by adherence to information quality and peer review standards, have given EPA policy-makers relevant, timely, and credible scientific information to guide Agency decisions.

ORD—Making a Difference

ORD scientists are committed to generating products of the highest quality to ensure sound science informs Agency decision-making. Our successes have been numerous, and we continue to build upon them. I have highlighted below a sampling of such successes, to illustrate the depth, breadth, and relevance of our research programs' contributions to environmental science generally and to EPA's mission in particular. As these examples demonstrate, ORD's research program—as a major part of the entire EPA scientific endeavor—plays a critical role in protecting human health and safeguarding the environment.

- In July 2003, EPA conducted an important drinking water distribution field study to map the movement of contaminants in a water system. This research is helping water system managers and emergency responders better predict how a biological or chemical contaminant would react in a drinking water system. This study ties directly into EPA's community support and homeland security efforts.
- ORD, working with academia, developed the first air quality model (Models-3/CMAQ) to use a "one atmosphere" approach to simulate the interactions among many air pollutants, which is necessary to achieve truly cost-effective air pollution control strategies. This work is critical for local air pollution forecasting, as well as supporting the Agency's multi-pollutant control strategies.
- Working with the Department of Energy and the National Oceanic and Atmospheric Administration, ORD is researching exposures to air pollutants in complex terrains, such as urban canyons created by high-rise buildings and complex traffic patterns. This research combines field monitoring with wind tunnel studies to refine exposure models that can be applied to different U.S. cities.
- ORD developed toxicity methods for determining acute and chronic toxicity to plants, invertebrates, and vertebrates, using several different end points. ORD also participated in the development of the Whole Effluent Toxicity Test Methods Rule, which allows these methods to be used as a basis for decision-making in the National Pollutant Discharge Elimination Systems Program.
- ORD developed analytical methods for *Cryptosporidium* and evaluated technologies that could be used for removing *Cryptosporidium* from drinking water sources. ORD worked with the Office of Water to use these results in promulgating the Long-Term 2 Enhanced Surface Water Treatment Rule. This rule will protect drinking water consumers, including sensitive sub-populations such as children, by avoiding *Cryptosporidium* incidents that have resulted in health impacts and even death in the past.
- EPA's cancer risk assessment prompted industry decisions to phase-out the use of chromated copper arsenate (CCA) treated wood in home settings, due to concerns of exposure to kids from decks and play equipment. ORD is working with other EPA scientists to analyze exposures to homeowners and children from CCA-treated decks and play equipment and to evaluate coatings and sealants that can be used to reduce risk from exposure to CCA-treated wood.
- ORD developed a DNA-based system that allows rapid identification and quantification of molds in a matter of hours, as opposed to current methods that require days or even weeks. The new technology can be used to detect the mold *Stachybotrys,* commonly known as "black mold," and more than 50 other possibly harmful molds. The new method has been licensed to 13 companies for use in detecting mold, and four additional licenses are pending.
- EPA chairs the coordination of endocrine disruptor research across federal agencies through an interagency working group under the Committee on Environment and Natural Resources, under the President's National Science and Technology Council. Through this interagency working group, EPA and its partners issued two joint solicitations for research proposals to address the critical data gaps of understanding the impact of endocrine disruptors on humans and wildlife.

Linking Research Results to Outcomes

EPA recognizes that research findings—no matter how insightful or cutting-edge—cannot of their own accord achieve environmental outcomes. Achieving environmental outcomes depends on decisions made and actions taken by the Agency's program and regional offices, as well as by our State and tribal partners. We are working with our Office of Inspector General (OIG) to develop better ways to describe the link between our research program and environmental and public health outcomes. Our efforts are focused on the use of a logic model that was developed by the OIG.

The OIG, in collaboration with the ORD, piloted using the logic model to determine if the design of the Pollution Prevention and New Technology research program was conducive to achieving desired environmental outcomes. The pilot was successful, and we now employ logic models to clearly identify the outputs of our research and their associated near-term outcomes. Logic model techniques are par-

ticularly useful for identifying outputs and methods for transferring research results to our clients, helping them to achieve environmental outcomes.

The logic model also emphasizes that there are factors outside the realm of science that may help or hinder the success of the program and the accomplishment of its results. ORD scientists, EPA program offices, and our State, tribal, and local clients each have their respective roles for helping to achieve environmental outcomes. In light of this, ORD believes that research programs are most appropriately evaluated with respect to the soundness of the research strategy, the significance of the research findings, and the usefulness of the resulting scientific tools or policies for their intended applications. We also believe there is an important role for independent, expert peer review for accomplishing such evaluations.

ORD is moving forward with its plans to conduct reviews of its research programs by external independent experts. These expert panels will review our research in accordance with the Administration's investment criteria for research and development; namely, quality, relevance, and performance. These reviews will provide valuable input for determining that ORD is managing its programs to ensure scientific quality, and is providing relevant results for achieving the Agency's mission.

It is a challenging task to relate research, especially inherently long-term research, to specific environmental and public health outcomes. However, as I mentioned earlier, I am committed to moving ORD in that direction. The PARTs conducted last year have provided up with valuable experience that will help us demonstrate the value of our programs, and we are working with OMB to develop recommendations to improve program performance.

Science to Achieve Results Research

Mr. Chairman, your letter of invitation asked me to specifically address the reduction of EPA's STAR grants for research on ecological systems, pollution prevention, endocrine disruptors, and mercury. While I will address the specific reductions later in my testimony, I want to share at this point some of my thoughts and the thoughts of others about our STAR program and how it continues to be a vital part of ORD's research portfolio.

In 1995, ORD created the Science To Achieve Results extramural research program. This program was created for the purpose of providing ORD swift, flexible access to nationally and internationally acclaimed scientists who could conduct independent and original research to complement the efforts of ORD's intramural research program.

Since the program's inception, all or parts of the STAR program have been reviewed three times by the EPA SAB and twice by the NRC. These reviews have been very favorable, but have also noted areas for improvement. As the NRC is also a witness today, I will leave it to them to describe the findings of their 2003 review of the STAR program, *The Measure of STAR*.

EPA has developed an in-house staff capability to address environmental research needs. In some cases, EPA lacks a critical mass of in-house expertise that can devote itself full-time to new research issues, and the STAR program enables ORD to quickly deploy resources to access nationally and internationally acclaimed scientists to conduct independent and original research where the Agency lacks capacity or specialized expertise.

The STAR program remains strong and is aligned to most effectively support EPA's priority research needs. For example, STAR research efforts will be funded consistent with previous years' investments in important areas including children's health, particulate matter, safe food, and drinking water. In those areas where STAR will be eliminated in FY 2005 (ecological systems, pollution prevention, endocrine disruptors, and mercury), EPA will continue to conduct in-house research as well as look to increase its ongoing research partnerships with university researchers and initiate new ones. STAR currently leverages its resources through joint solicitations with 12 federal and private sector research partners, enabling EPA to enhance its research portfolio by about 30 to 50 additional grants.

FY 2005 President's Budget

The President's FY 2005 budget request continues the tradition of ORD research excellence by emphasizing cutting-edge science and technology, collaboration with other agencies, and an orientation on results.

Mr. Chairman, in your letter of invitation you asked me to identify what research would not be done as a result of the proposed reductions in the STAR grants program in the President's Budget request and the associated impacts. The following are areas of decreased STAR research.

Ecological Protection Research Grants (-$22.2M)

EPA would no longer fund STAR grants in the area of ecological protection, a reduction of about 50 grants. In response to PART findings, EPA is working to develop long-term, annual, and efficiency performance measures for the program. Key areas of research at academic institutions across the Nation would no longer be conducted, affecting Agency efforts to assess ecosystem condition, diagnose ecosystem impairment, and forecast ecosystem health.

Hazardous Substance Research Centers (HSRCs) (-$2.25M)

Eliminate most of the research in the fifth and final year of planned funding for the HSRCs, as well as the technical support and outreach efforts of the centers that directly support EPA regional, State, and tribal efforts to evaluate and manage risk at clean-up sites.

Mercury Research (-$2.0M)

Eliminate STAR-supported university research in support of understanding the atmospheric processes that affect the transport, transformation, and deposition of mercury emissions from natural and anthropogenic sources.

Endocrine Disruptors (-$4.7M)

Eliminate funding for the STAR portion of the Endocrine Disruptors research program. However, the President's Budget provides a $3.5 million increase for EPA's computational toxicology program, which uses computational chemistry and molecular biology to more accurately predict health effects from chemicals, thereby improving linkages between potential exposure and disease. Our computational toxicology program offers more promising and timely application for our Endocrine Disruptors Screening Program.

Pollution Prevention and New Technologies (-$6.0M)

Transfer funding of the research program to the Office of Pesticides, Prevention, and Toxic Substances pollution prevention program, which the PART analysis has shown a reduction in the use of chemicals and pollution. In response to PART findings, the program is working to develop long-term, annual, and efficiency performance measures.

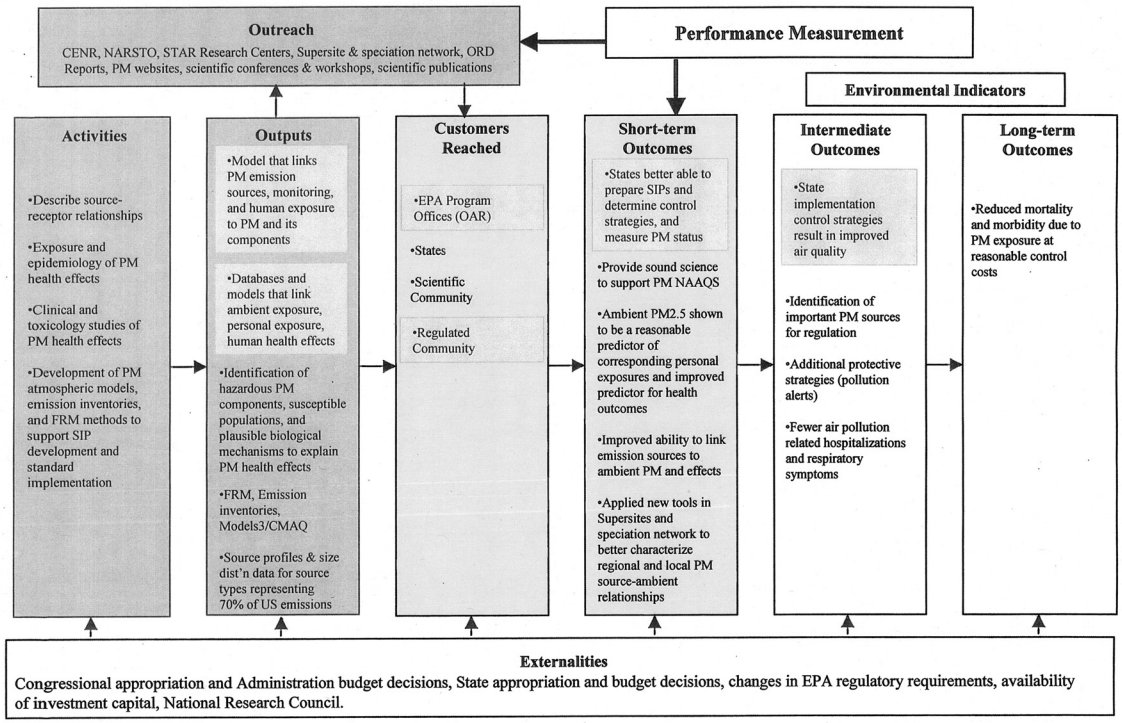
Conclusion

By uniquely combining human health and ecological research in one federal agency, ORD has made significant contributions to developing a better understanding of environmental risks to both human health and ecosystems. The results of this research have consistently and effectively informed EPA's environmental decision-making, leading to environmental policies based on sound science at the federal, State, tribal, and local level.

The President's FY 2005 budget request for ORD continues this tradition of excellence, by emphasizing cutting-edge science and technology, collaboration with other agencies, and an orientation on results.

Thank you.

Logic Model for the Particulate Matter Research Program



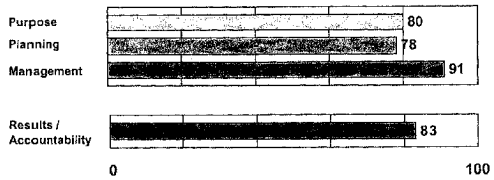
ENVIRONMENTAL PROTECTION AGENCY

50

Link to PART details on OMB website.

Program: *Acid Rain*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Percent reduction in number of chronically acidic waterbodies in acid-sensitive regions.	2030	-30%	
Annual Measure: Percent reduction in average nitrogen deposition and mean ambient nitrate concentrations	2004	-5%	
	2007	-10%	
	2010	-15%	
Annual Efficiency Measure: Measure Under Development			

Link to PART details on OMB website.

Rating: *Moderately Effective*

Program Type: *Regulatory Based*

Program Summary:
The Acid Rain program implements Title IV of the Clean Air Act. The program uses a successful emissions trading scheme to cut the total sulfur dioxide (SO2) and nitrogen oxides (NOx) emissions as a means of reducing acid deposition and generally protecting human health and the environment.

The program is widely accepted as successful and the trading mechanism it employs has been acknowledged as a cost-effective means of reducing emissions by independent reviews. This PART analysis indicates that the program is significantly restricted in how much impact it can make on the persisting human health and environmental issues associated with SO2 and NOx emissions because of existing statutory limitations. In addition, though the program has been reviewed periodically and said to be cost-effective, the program currently lacks efficiency measures to track progress over time.

Recommendations:

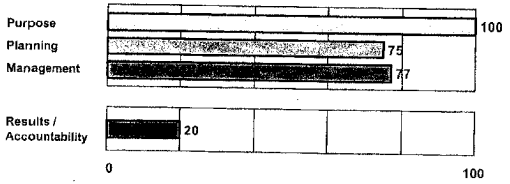
1. Remove statutory requirements that prevent program from having more impact including (but not limited to) barriers that; set maximum emissions reduction targets, exempt certain viable facilities from contributing, and limit the scope of emission reduction credit trading. The Administration's Clear Skies proposal adequately addresses these and other statutory impediments. Program should work as appropriate to promote the enactment of the Clear Skies legislation.
2. Program should develop efficiency measures to track and improve overall program efficiency. Measures should consider the full cost of the program, not just the federal contribution.

Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
17	17	17

Program: Air Toxics

Agency: *Environmental Protection Agency*
Bureau: *Environmental Protection Agency*



☐ Results Achieved
☑ Results Not Demonstrated
☐ Measures Adequate
☑ New Measures Needed

Key Performance Measures	Year	Target	Actual
Long-term Measure: Percent of U.S. population free from unacceptable risks of cancer and other significant health problems from air toxic emissions	2020	95	
Annual Measure: Percentage reduction in nationwide air toxics emissions from stationary and mobile sources combined (actual data available later in 2003)	2002	5	
	2001	5	
	2000	3	
	1999	12	
Efficiency Measure: Measure under development			

Link to PART details on OMB website.

Rating: Results Not Demonstrated

Program Type *Direct Federal*

Program Summary:

The Air Toxics program is designed to reduce emissions of hazardous air pollutants (HAPs), such as hexane and benzene, from stationary sources, such as factories, and from vehicles.

The program's purpose is clearly laid out in the statute -- to reduce HAP emissions and unacceptable health risk from HAPs. The assessment showed that management is generally good. However, EPA has not fully utilized statutory flexibilities when implementing parts of the program. Although the long-term cancer reduction goal is clearly outcome-related, "unacceptable risk" is not defined, the relation between emissions changes and actual health outcomes are not known, and there are no efficiency measures. Specific findings include:
1. There is a clear purpose and design for the program.
2. The program has not shown it is maximizing net benefits, and proposing the most cost effective regulations.
3. There are inadequate linkages between annual performance and long-term goals that prevent it from demonstrating its impact on human health.
4. There are large data gaps for toxicity and on actual population exposure.

In response to these findings, the Administration will:
1. Increase funding for toxic air pollutant programs by $7 million in State grants for monitoring to help fill data gaps.
2. Focus on maximizing programmatic net benefits and minimizing the cost per deleterious health effect avoided.
3. Establish better performance measures (including an appropriate efficiency measure).

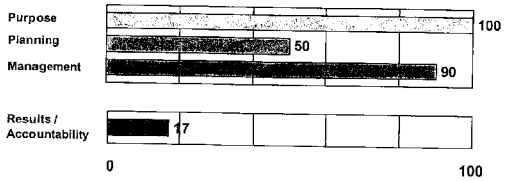
(For more information on this program, please see the Environmental Protection Agency chapter in the Budget volume.)

Program Funding Level (in millions of dollars)

* This assessment has not changed since publication in the 2004 Budget. For updated program funding levels, see Data File - Funding, Scores, and Ratings.

Program: Brownfields

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Brownfields Properties Assessed	2002	2,500	
	2008	9,200	
Annual Measure: Assessed Properties Redeveloped (new measure - targets under development)			

Link to PART details on OMB website.

Rating: Adequate

Program Type: *Competitive Grant*

Program Summary:

The Environmental Protection Agency's Brownfields program attempts to stimulate reuse of properties idled because of actual or perceived hazardous waste contamination. Once the property is cleaned and private developers no longer need to fear potential Superfund liability, they turn these abandoned parcels into housing, businesses, and parks.

The assessment found that the Brownfields program has a clear purpose but lacked adequate strategic planning, specifically setting goals that are adequately ambitious. Specific findings include:

1. The purpose of the Brownfields program is clearly articulated in the Small Business Liability Relief and Brownfields Revitalization Act.
2. The program is well managed, but would benefit from regular independent evaluations and a systematic process to review strategic planning.
3. The program has been popular and apparently successful in the last few years and has largely overtaken its current goals. Unfortunately, these goals can no longer be viewed as ambitious and need to be reestablished. The program also has no efficiency measures and lacks a process for regular independent review.
4. The program has grown dramatically since its authorization in 2002, but new goals, commensurate with its funding, have not yet been put into place. The current goals are not ambitious.

In response to these findings, the Administration will:

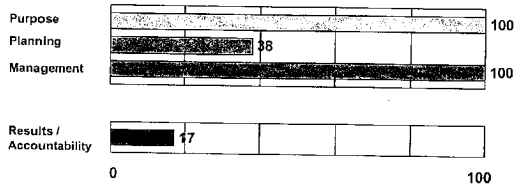
1. Consistent with program expansion, continue to assess and clean-up Brownfields sites at an accelerated rate.
2. Work to develop more ambitious long term assessment targets that focus on redevelopment, since the current targets are within easy reach.

Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
167	170	210

Program: *Civil Enforcement*

Agency: *Environmental Protection Agency*
Bureau: *Office of Enforcement and Compliance Assurance*



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Pounds of pollutants reduced (characterized as to risk and exposure) (revised measure and targets under development).			
Annual Measure: Millions of pounds of pollutants reduced through concluded enforcement actions.	2002	300	261
	2003	300	600
	2004	350	
	2005	300	
Annual Measure: Pounds of pollutants (in thousands) reduced , treated, or removed per workyear (targets under development).	2000		617
	2001		760
	2002		245
	2003		2,577

Link to PART details on OMB website.

Rating: *Results Not Demonstrated*

Program Type: *Direct Federal*

Program Summary:

EPA's civil enforcement program enforces federal environmental laws to protect human health and the environment by ensuring that regulated entities comply with these laws. EPA's management of their federal enforcement responsibility includes direct federal actions (inspections, investigations, compliance assistance and incentives) as well as assisting and overseeing state, tribal, and local partners in achieving compliance to protect human health and the environment.

The assessment found:
1. The program's outcome measure, pounds of pollutants reduced, needs further characterization as to risk and exposure.
2. The targets used for this measure are not meaningful, inasmuch as they fall within the normal range of variation.
3. The program shows strong management, because although past outside evaluations have raised concerns with lack of workload analysis to support resource allocations, EPA has undertaken a Workload Deployment review and is implementing it to address and correct these concerns.
4. EPA management is also addressing the lack of adequate non-compliance rates and data quality issues, which further complicate targeted enforcement, by conducting data audits to foster improvements.

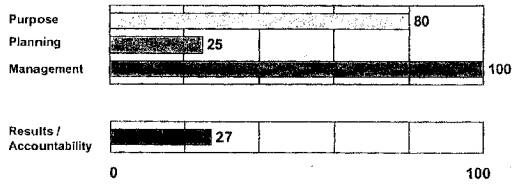
In response to these findings, the Administration will:
1. Redirect funds to develop statistically valid non-compliance rates.
2. Continue to fund $5M for an improved compliance data system.
3. Continue to develop efficiency and outcome oriented performance measures.
4. Develop programs and methodologies to determine which enforcement tools, inspections, compliance assistance centers, audit incentives, are the most efficient and result in the most significant reduction of pollutants.

Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
431	448	456

Program: *Clean Water State Revolving Fund*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Percent of stream miles/acres of water identified in 2000 as not attaining standards that fully attain water quality standards.	2006	5%	
	2012	25%	
Annual Measure: Percent of all major Publicly Operated Treatment Works (POTWs) that comply with their permitted wastewater discharge standards	2002	97.6%	97.6%
	2003	98%	
	2004	98%	
	2005	98.5%	
Long-term Efficiency Measure: Measure Under Development			

Rating: *Results Not Demonstrated*

Program Type: *Block/Formula Grant*

Program Summary:

The Clean Water State Revolving Fund (SRF) program capitalizes state revolving loan funds that finance infrastructure improvements for public wastewater systems and other activities that mitigate or reduce sources of water quality impairment. Most of the money has gone to upgrade wastewater treatment plants.

A challenge facing the Clean Water SRF program is to develop performance measures that demonstrate more directly the impact of the program on water quality improvement. An acceptable outcome efficiency measure has not yet been developed.

Additional findings include:

1. The program purpose is clear and it is designed to have a significant impact on a well identified need.
2. The Clean Water SRF program is very competent as a national financial resource for state infrastructure projects targeted at compliance with water quality standards.
3. The program has not shown that states are operating their SRFs to ensure sustainability after federal capitalization ends, suggesting a possible flaw in program design.
4. Evaluation of public health impacts from infrastructure improvements is difficult, in part because states provide only aggregate data.

In response to these findings, the Administration will:

1. Develop an outcome efficiency measure that demonstrates the marginal benefit to environment per dollars expended for the program.
2. Develop/Improve annual performance measures to capture the full range of sources and contaminants that affect water quality and ecosystem health.

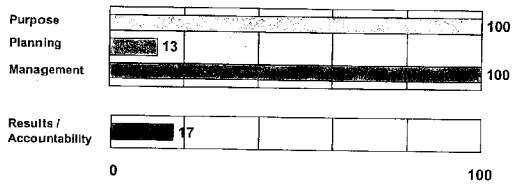
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
1,341	1,342	850

Link to PART details on OMB website.

Program: *Criminal Enforcement*

Agency: *Environmental Protection Agency*
Bureau: *Office of Enforcement and Compliance Assurance*



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Millions of pounds of pollution reduced, eliminated or curtailed (to be further developed as to risk and exposure).	2002		20.5
	2003		40.6
Annual Measure: Reduction from recidivism baseline (baseline and targets under development).			
Long-term Efficiency Measure: Pounds of pollution reduced per workyear (targets under development).			

Link to PART details on OMB website.

Rating: *Results Not Demonstrated*

Program Type: *Direct Federal*

Program Summary:

EPA's Criminal Enforcement Program investigates violations of laws, regulations, and permit conditions that cause or threaten significant harm to human health or the environment, and refers cases to the Department of Justice and to the States for prosecution.

The assessment found:

1. The program measures most results in outputs, i.e., number of criminal inspections, number of training classes, number of criminal enforcement actions, rather than outcome measures.
2. The outcome measure used, pounds of pollutants reduced, varies from year to year. The pollution reduced is also not characterized as to degree of risk or extent of exposure to human health.
3. There is no good data or methodology used by EPA to assess general deterrence.
4. The program suffers from a lack of statistically valid non-compliance rates.

In response to these findings, the Administration will:

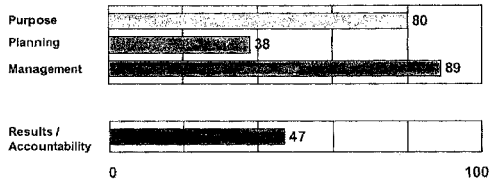
1. Develop an outcome measure, pounds of pollutants reduced, that is characterized as to risk and exposure to ensure that the most harmful violations are being prosecuted.
2. Develop targets for the above outcome measure that quantify real change, not just variations.
3. Develop statistically based recidivism rates, and measure the change to these rates.
4. Develop programs and methodologies to address deterrence issues.
5. Develop statistically valid non-compliance rates.

Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
40	42	43

Program: *Drinking Water State Revolving Fund*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Percent population served by community water systems in compliance with health-based drinking water standards.	2002	91.6%	91.6%
	2008	95%	
Annual Measure: Percent community water systems in compliance with drinking water standards.	2002	91.6%	91.6%
	2003	92%	
	2004	92.5%	
	2005	93%	
Long-term Efficiency Measure: Measure Under Development			

Rating: *Results Not Demonstrated*

Program Type: *Block / Formula Grant*

Program Summary:

The Drinking Water State Revolving Fund (SRF) program capitalizes state revolving loan funds that finance infrastructure improvements for public water systems and other activities that support state drinking water programs and promote public health protection. Most of the money has gone to upgrade water treatment plants.

The PART completed for the 2004 Budget recommended the development of performance measures that better demonstrate the impact of the program. Reassessment of the program under the 2005 PART guidelines found that the Drinking Water SRF program has implemented acceptable performance measures, however, an acceptable outcome efficiency measure has not yet been developed.

Additional findings include:

1. The program purpose is clear and it is designed to have a significant impact on a well identified need.
2. The Drinking Water SRF program is very competent as a national financial resource for state infrastructure projects targeted at compliance with health-based drinking water standards.
3. The program has not shown that states are operating their SRFs to ensure sustainability after federal capitalization ends.
4. Evaluation of public health impacts from infrastructure improvements is difficult, in part because states provide only aggregate data.

In response to these findings, the Administration will:

1. Develop an outcome efficiency measure that demonstrates the marginal benefit to public health per dollars expended for the program.
2. Demonstrate other government partners' commitment to work toward annual performance goals by showing improvement in drinking water system compliance reporting by states.

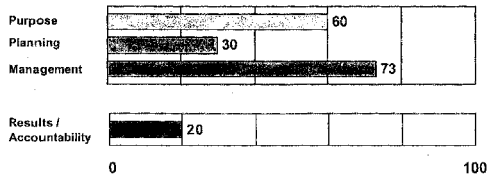
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
850	845	850

Link to PART details on OMB website.

Program: *Ecological Research*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: The states and tribes use a common monitoring design and appropriate ecological indicators to determine the status and trends of ecological resources			
Annual Measure: Measures under development.			

Rating: *Results Not Demonstrated*

Program Type: *Research and Development, Competitive Grant*

Program Summary:

The Environmental Protection Agency's (EPA's) Ecological Research Program is designed to provide the scientific understanding to measure, model, maintain, and/or restore, at multiple scales, the integrity and sustainability of ecosystems now and in the future. EPA's ecosystem research program uses a combination of in-house and competitive grants to carry out research.

Additional findings include:

1. Because the program does not adequately coordinate with other EPA offices and other agencies, it lacks enough information to effectively target its resources.
2. The program lacks adequate annual and efficiency measures, as well as ambitious targets for its long-term measure.
3. Program evaluations have focused only on process, resulting in a low planning score. An evaluation could help EPA eliminate the program's redundancies with other Federal agencies and improve its relevance for other EPA programs.

In response to these findings, the Administration will:

1. Encourage EPA to develop one or two more outcome-oriented long-term measures, as well as annual and efficiency measures.
2. Reduce funding in FY 2005 by $22 million. Savings from this reduction will be shifted to other high priority efforts in EPA, including the water quality monitoring initiative. Funding may be increased when the program develops sufficient performance measures and demonstrates results.

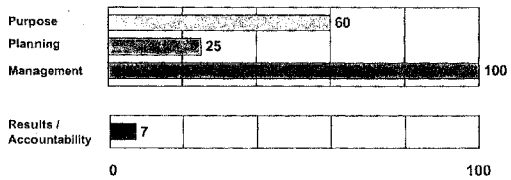
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
132	132	110

Link to PART details on OMB website.

Program: *Environmental Education*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Measures not needed due to zero funding.			

Rating: *Results Not Demonstrated*

Program Type: *Competitive Grant*

Program Summary:
The Environmental Education program was created to provide leadership and resources to the field of environmental education at the local, state, national and international levels; to encourage careers related to the environment; and to leverage non-Federal investment in environmental education and training programs.

The assessment found:
1. The program lacks strategic planning and cannot show program results. The program has strong management of its grants.
2. The program has not established long-term or annual performance measures that would measure educational performance, such as student achievement, teacher aptitude, or number of fellows pursuing environmental careers. The program also has not developed an efficiency measure.
3. The program is duplicative of other state, local, and private efforts.
4. The law requires the program to implement and manage specific programs, with specific allocation of funds to those programs. This can prevent EPA from distributing funds or pursuing other educational programs based on performance.
5. The program has not had any independent evaluations.

In response to these findings, the Administration proposes that this program not be funded and resources be used to achieve other environmental goals.

Program Funding Level (in millions of dollars)

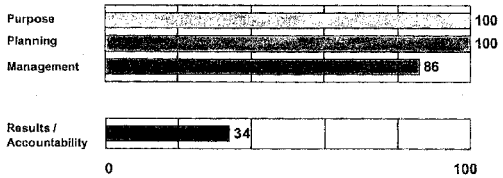
2003 Actual	2004 Estimate	2005 Estimate
9	9	0

Link to PART details on OMB website.

Program: *Existing Chemicals*

Agency: *Environmental Protection Agency*

Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Percent cumulative reduction of chronic human health risk from environmental releases of industrial chemicals in commerce since 2001.	2005	12%	
	2006	15%	
	2007	18%	
	2008	21%	
Annual Measure: Cumulative number of chemicals with proposed, interim, and/or final values for Acute Exposure Guideline Levels (AEGL).	2002		85
	2005	125	
	2006	145	
	2008	187	
Annual Efficiency Measure: Cost and time to establish AEGL value per chemical (under development).			

Rating: *Adequate*

Program Type: *Direct Federal*

Program Summary:

The Environmental Protection Agency (EPA) reviews and regulates chemical substances and mixtures that may harm human health or the environment. EPA's Existing Chemicals program covers the 62,000 chemicals that were already in commerce when Congress enacted the Toxic Substances Control Act, including testing, regulation, and reporting.

The assessment found:

1. The program has a clear purpose and strong management and has improved its strategic planning.
2. In response to recommendations in the 2004 President's Budget, the program has created a new long-term measure that is outcome-focused. In addition, the program is developing a long-term outcome efficiency measure.
3. As part of the 2004 President's Budget, the program has invested in the development of acute exposure chemical guidelines (AEGLs), which are important for homeland security response, recovery, and preparedness. The program has developed long-term, annual, and efficiency measures for this investment.
4. The program must set ambitious targets for its measures and demonstrate results.

In response to these findings, the Administration will:

1. Create outcome measures for AEGLs.
2. Develop a long-term outcome efficiency measure.
3. Maintain funding at the 2004 President's Budget level.

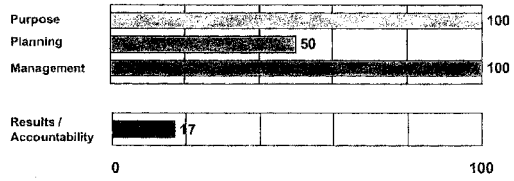
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
16	17	17

Link to PART details on OMB website.

Program: *Leaking Underground Storage Tanks*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	Year	Target	Actual
Long-term Measure: Measure Under Development			
Annual Measure: Number of Cleanups Completed	2001	21,000	19,074
	2002	21,000	15,769
	2003	21,000	21,000 (est.)
Annual Efficiency Measure: Measure Under Development			

Rating: *Results Not Demonstrated*

Program Type: *Block/Formula Grant*

Program Summary:

The purpose of the Leaking Underground Storage Tank program is to clean up leaking underground petroleum tanks.

The assessment found that the Leaking Underground Storage Tank program has a clear purpose but lacked adequate strategic planning, specifically with regard to setting goals that are adequately ambitious or that show clear human health or environmental outcomes. Specific findings include:

1. The program purpose, to clean up leaking underground storage tanks, is clearly defined and is understood by states and other stakeholders.
2. The program is well managed, but would benefit from regular independent evaluations and a systematic process to review strategic planning.
3. Strategic planning is particularly critical to this program since it has already achieved its current long term goal and has no new long-term goal to challenge program managers. The Environmental Protetion Agency (EPA) may finish the backlog of 140,000 cleanups within the next decade. In the future, a smaller program may be suitable to address the lesser number of new releases that occur every year.
4. The program appears to be successful, as evidenced by achieving the goals of its authorizing legislation: cleanup of releases and upgrading tanks. However, the program scores poorly on the results section since it has no outcome based performance metrics that demonstrate an impact on people and the environment.

In response to these findings, the Administration will:

1. Continue to clean storage tank sites at a rapid pace.
2. Develop outcome measures that will test the link between the activities of the program and the impact on human health and the environment.

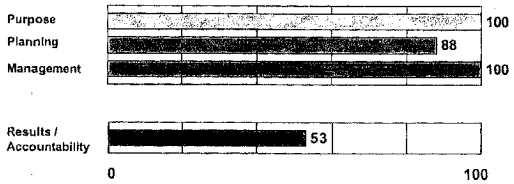
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
72	76	73

Link to PART details on OMB website.

Program: *New Chemicals*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Cumulative reduction of releases of industrial hazardous chemicals to the environment and in industrial wastes in millions of pounds.	2002		190
	2004	450	
	2005	590	
	2008	960	
Long-term Efficiency Measure: Review costs per chemical (for EPA and indusry) (under development).			
Annual Measure: Annual cumulative quantity of water conserved (millions of gallons).	2002		330
	2005	500	
	2007	600	
	2008	650	

Rating: *Moderately Effective*

Program Type: *Direct Federal*

Program Summary:

The Environmental Protection Agency's (EPA's) New Chemicals program reviews new chemicals being introduced into commerce (manufactured or imported) to prevent possible harm to the public and environment.

The assessment found:
1. The program has very strong purpose and management.
2. In response to recommendations in the 2004 President's Budget, the program has improved its strategic planning and results. It is currently considering an independent evaluation of the program.
3. In response to recommendations in the 2004 President's Budget, the program is developing a long-term outcome measure on risks to the public avoided and has developed an efficiency measure to track costs per new chemical review.

In response to these findings, the Administration will:
1. Maintain funding at the 2004 President's Budget level.
2. Establish targets and timeframes for its measures, including efficiency measures.
3. Propose appropriations language to change the Toxic Substances Control Act to lift the cap on fees that the Agency can collect for new chemical reviews.

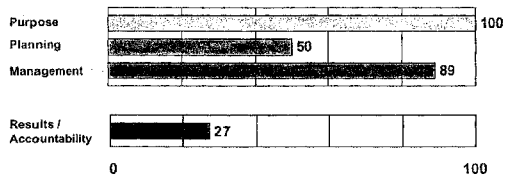
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
15	15	15

Link to PART details on OMB website.

Program: *Nonpoint Source Grants*

Agency: *Environmental Protection Agency*
Bureau: *Office of Water*



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Number of primarily nonpoint source impaired waters that will partially or fully attain designated uses	2008	250	
	2012	700	
Annual Measure: Annual reduction of total nitrogen loadings in thousands of pounds (targets under development)	2003	329	
Annual Measure: Annual reduction of total phosphorus loadings in thousands of pounds (targets under development)	2003	110	

Rating: *Results Not Demonstrated*

Program Type: *Block / Formula Grant*

Program Summary:

The Nonpoint Source Grants program provides grants to States to identify nonpoint source (NPS) problems and develop effective, locally-supported solutions. The PART completed for the 2004 Budget recommended the development of performance measures and at least one outcome efficiency measure that better demonstrate the impact of the program. Reassessment of the program under the 2005 PART guidelines found that the Nonpoint Source Grants program has developed acceptable performance measures; however, meaningful efficiency measures have not yet been developed.

Additional findings include:

1. The program purpose is clear and it is designed to have a significant impact on a well identified need.
2. The program has strong management practices and excellent oversight of grantees' progress; however, the program lacks meaningful efficiency measures.
3. Adequate data are not yet available to determine whether changes in the program have a significant effect on NPS pollution.

In response to these findings, the Administration will:

1. Develop efficiency measures including an outcome efficiency measure that demonstrates the marginal benefit to the environment per dollars expended for the program.
2. Reduce funding by $14 million in recognition of increased spending on nonpoint source pollution through USDA Farm Bill programs.

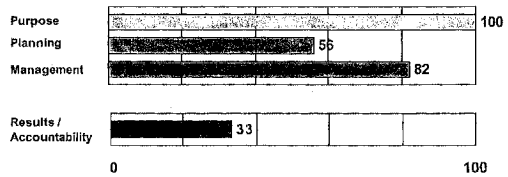
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
237	195	209

Link to PART details on OMB website.

Program: *Particulate Matter Research*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Measure Under Development			
Annual Measure: Measure Under Development			
Long-term Efficiency Measure: Measure Under Development			

Rating: *Results Not Demonstrated*

Program Type: *Research and Development, Competitive Grant*

Program Summary:
The Environmental Protection Agency (EPA) is conducting a multi-year research program to improve the scientific understanding of particulate matter (PM). Fine particles that are less than 2.5 microns in diameter are composed of a large variety of different physical and chemical properties. PM may be directly emitted as primary particles or secondary aerosols that are chemically formed in the atmosphere from several precursor emissions. Primary particles originate from combustion, materials handling, industrial activities, surface corrosion, and from natural sources (desert dust, sea salt, organic material, etc.). Some fraction of secondary aerosols is inorganic (ammonium salts of nitrates and sulfates) and generated from sulfur dioxide, nitrogen oxides and ammonia emissions, while secondary organic aerosols are a product of complex photochemical processes in the atmosphere involving volatile organic compounds. On July 16, 1997 the President directed EPA to undertake a major research program to reduce scientific uncertainties associated with the health and environmental effects of PM and the means of reducing them. In addition, the Congress requested the National Research Council to develop a conceptual framework for the research. The NRC identified 10 high-priority research topics, which, if fully evaluated, would reduce the uncertainties in the scientific evidence and guide regulation of PM in the United States. The NRC published three periodic reviews of the research and has found that none of the topics has been completed. The PART assessment leaned heavily on the NRC's findings.

1. The assessment indicates that the program has an important purpose.
2. While there are clear goals, there are inadequate means to measure progress toward achieving them. For example, 8 of 10 priority areas have achieved moderate to significant advancement toward uncertainty reduction, but only 2 are largely complete. EPA relies on multi-year plans, which while providing necessary flexibility due to progress in scientific understanding, do little to benchmark progress toward uncertainty reduction.

In response to these findings, the Administration will:
1. Continue a strong emphasis on PM research, especially on co-pollutant effects, assessment of hazardous components, and identification of the sources of those hazardous components, and
2. Establish a better metric for uncertainty reduction, which is the established, and widely supported outcome for this program.

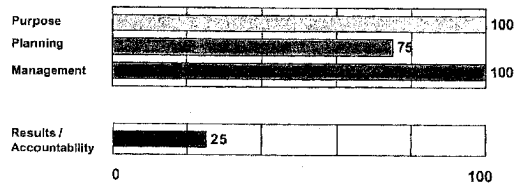
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
61	65	65

Link to PART details on OMB website.

Program: *Pesticide Registration*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Percent reduction in terrestial and aquatic wildlife mortality incidents involving pesticides	2008	-30%	
Annual Measure: Percentage of agricultural acres treated with reduced-risk pesticides	2002	1%	7.5%
	2003	8.1%	
	2004	8.5%	
	2005	8.7%	
Long-term Efficiency Measure: Percent reduction in review time for registration of conventional pesticides.	2008	-10%	

Link to PART details on OMB website.

Rating: *Adequate*

Program Type: *Direct Federal*

Program Summary:

The Pesticide Registration program at the Environmental Protection Agency (EPA) evaluates new pesticides and registers them for use in the United States. EPA examines the ingredients of the pesticide, how it will be used, as well as storage and disposal practices to ensure that, when used properly, the pesticide will not have adverse effects on humans or the environment.

This is the second year that this program has been assessed. This year's assessment found:

1. In response to recommendations in the 2004 President's Budget, the program has established long-term outcome goals that are general indicators of environmental and health risks.
2. The program still lacks adequate independent reviews of performance but is considering contracting to address this.
3. In response to recommendations in the 2004 President's Budget, the program has developed program-level efficiency measures and has implemented information technology changes to address some specific inefficiencies.

In response to the findings from this year's review:

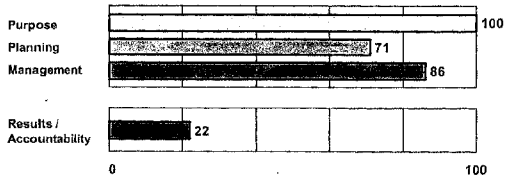
1. The Administration recommends maintaining funding at the 2004 President's Budget level adjusted for the annual pay increase.
2. The program will develop long-term risk-based outcome performance measures that will supplement the existing long-term measures.
3. The program will also work on long-term outcome efficiency measures.

Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
45	66	66

Program: Pesticide Reregistration

Agency: *Environmental Protection Agency*
Bureau: *Environmental Protection Agency, activities*



☐ Results Achieved ☐ Measures Adequate
☑ Results Not Demonstrated ☑ New Measures Needed

Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Measure under development			
Annual Measure: Percent of Reregistration Eligibility Decisions (REDs) completed A RED document summarizes the reregistration conclusions and outlines any risk reduction measures necessary for the pesticide to continue to be registered in the U.S.	2001	72.4	71.6
	2002	76.4	72.7
	2003	83	
	2004	88	
Efficiency Measure: Measure under development			

Rating: Results Not Demonstrated

Program Type *Direct Federal*

Program Summary:

The Pesticide Reregistration program reviews pesticides already registered by EPA to make sure they meet current scientific and regulatory standards. The reregistration process considers the human health and ecological effects of pesticides and can result in changes to existing registrations to reduce risks that are of concern.

The assessment indicates that the program addresses an unambiguous quantifiable need and that further work is needed in the areas of efficiency evaluation and performance measurement. Specific findings include:
1. The program is the only entity that reviews existing pesticides to ensure they keep pace with advancing safety standards. The program has a clear mission and statutory authority.
2. The program has established long-term goals but they are not adequate because the goals lack quantified baselines and/or targets and because they need to be more outcome-focused.
3. The program regularly reviews progress toward annual goals and does make management decisions to address issues that impede progress but the program does not use efficiency or cost effectiveness measures to monitor program management and performance.
4. EPA has proposed a long-term efficiency goal for this program that targets reductions in decision-making time but further work is needed to finalize the goal and to develop appropriate annual targets to support it.
5. The program has met statutory deadlines but does not always meet annual goals and it is unclear how achieving annual targets leads to quantifiable progress toward the program's long-term goals. Progress toward future deadlines will require additional work on antimicrobial pesticides.

As a result of this review, the Administration:
1. Recommends providing an additional $1.0 million for antimicrobial pesticides and $0.5 million for inerts reregistration activities.
2. Will implement appropriate long-term performance measures, improved annual targets, and adequate long and short term efficiency measures.

(For more information on this program, please see the Environmental Protection Agency chapter in the Budget volume.)

Program Funding Level (in millions of dollars)

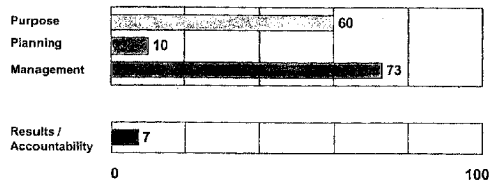
* This assessment has not changed since publication in the 2004 Budget. For updated program funding levels, see Data File - Funding, Scores, and Ratings.

Link to PART details on OMB website.

Program: *Pollution Prevention and New Technologies*

Agency: *Environmental Protection Agency*

Bureau: *Office of Research and Development (ORD)*



Key Performance Measures	Year	Target	Actual
Long-term Measure: Measure Under Development			
Annual Measure: Measure Under Development			
Long-term Measure: Measure Under Development			

Rating: *Results Not Demonstrated*

Program Type: *Research and Development, Competitive Grant*

Program Summary:

The Pollution Prevention and New Technologies program is a research program. The program's purpose is to provide a range of options to industry; state, local, and federal government; and academia for reducing pollution.

The assessment found:

1. The program lacks strategic planning and cannot show results.
2. The program has not established adequate long-term or annual performance goals to indicate whether its efforts have resulted in decreases in pollution, which is the purpose of the program. The program's results are mainly the creation of models, methods, and reports on its research, and it is unable to show whether these are used by industry and, if so, to what extent they are used. The program also has not developed an efficiency measure.
3. The program has not addressed findings in independent evaluations, which included recommendations to improve its strategic planning for greater results.
4. Some aspects of the program are duplicative of efforts in the private sector.

In response to these findings, the Administration will:

1. Shift funding from this research program to another Environmental Protection Agency (EPA) pollution prevention program that has shown results (see New Chemicals PART).
2. Recommend improvement of the program's strategic planning, including an independent evaluation of the program and responding to previous evaluations. In addition, the program should provide information on why it should pursue projects instead of other parties that are capable of conducting the projects.
3. Establish performance measures, including efficiency measures.

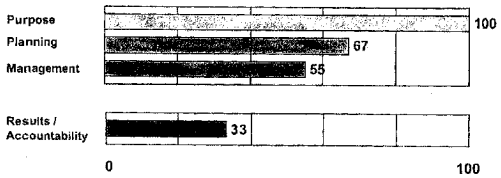
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
49	42	36

Link to PART details on OMB website.

Program: *RCRA Corrective Action*

Agency: *Environmental Protection Agency*
Bureau:



Key Performance Measures	*Year*	*Target*	*Actual*
Long-term Measure: Current human exposures under control (baseline and target under development)			
Annual Measure: Current human exposures under control (baseline and targets under development)			
Long-term Efficiency Measure: Measure Under Development			

Rating: *Adequate*

Program Type: *Regulatory Based*

Program Summary:

The purpose of the Resource Conservation and Recovery Act (RCRA) Corrective Action program is to ensure that owners or operators of hazardous waste treatment, storage, or disposal facilities investigate and clean up releases as necessary to protect human health and the environment. Much of the oversight work done by this program is done at the regional level and 38 states have been authorized to implement the Corrective Action requirements in lieu of the Environmental Protection Agency (EPA).

This PART analysis has found that the program is well designed in that it puts decision-making authority close to the actual clean up activity while still ensuring a certain amount of oversight and consistency in protecting human health and the environment. In addition, the program has established acceptable long term and annual outcome performance measures that tie directly to program activities and focus on protecting human health. But, the goals are no longer as ambitious as they were when first established and that new baselines and targets are needed in order for the measures to continue to be useful in tracking and guiding program performance.

Recommendations:

1. Program must define a new baseline for performance measures and establish appropriate annual targets to make goals more ambitious in achieving long-term objectives of the program.
2. Program should establish appropriate efficiency measures to adequately track program efficiency over time.

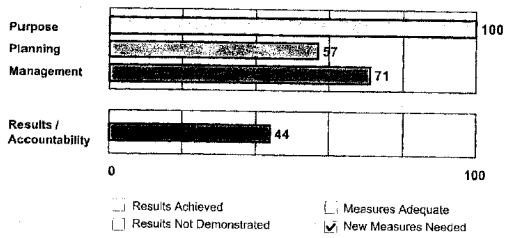
Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
35	39	39

Link to PART details on OMB website.

Program: Superfund Removal

Agency: *Environmental Protection Agency*
Bureau: *Environmental Protection Agency*



Key Performance Measures	Year	Target	Actual
Long-term Measure: Measure under development			
Annual Measure: Number of removals completed	2001	300	302
	2002	275	426
	2003	350	
	2004	350	
Efficiency Measure: Measure under development			

Rating: Results Not Demonstrated

Program Type *Direct Federal*

Program Summary:

Superfund's Removal Program is a short term cleanup program to remediate emergency and non-emergency situations in two years or less.

The assessment showed that:
1. The program's purpose, to perform emergency cleanup of hazardous materials, is very clearly defined and understood by states and stakeholders.
2. The program would benefit from regular independent evaluations and a systematic process to review strategic planning.
3. The program meets its targets for number of removals each year, an output measure. However, the program scores poorly on the Results/Accountability section since it has no outcome based performance metrics that demonstrate the extent of the impact on public health and the environment.
4. There are no efficiency measures and the development requires overcoming significant data issues, namely, poor historic data quality in EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database.

In response to these findings, the Administration will:
1. Propose funding at the 2003 President's Budget level.
2. Develop outcome oriented measures that test the linkage between program activities and the impact on human health and the environment.
3. Improve data quality in the CERCLIS database.

(For more information on this program, please see the Environmental Protection Agency chapter in the Budget volume.)

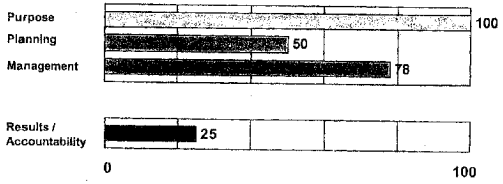
Program Funding Level (in millions of dollars)

*This assessment has not changed since publication in the 2004 Budget. For updated program funding levels, see Data File - Funding, Scores, and Ratings.

Link to PART details on OMB website.

Program: *Tribal General Assistance*

Agency: *Environmental Protection Agency*
Bureau: *American Indian Environmental Office - Office of Water*



Key Performance Measures	*Year*	*Target*	*Actual*
Annual Measure: % of tribes with delegated and non-delegated programs. (new targets under development)	2003	50	55
Long-term Measure: % decrease in the number of households in Indian Country with inadequate wastewater sanitation systems.	2015	50	
Long-term Efficiency Measure: Number of environmental programs implemented in Indian Country per million dollars (targets under development).			

Link to PART details on OMB website.

Rating: *Adequate*

Program Type: *Block / Formula Grant*

Program Summary:

The Environmental Protection Agency's (EPA's) Tribal General Assistance Program (GAP) provides tribes and intertribal consortia with financial assistance to plan, develop, and establish environmental programs. Tribes generally lag states in assuming and implementing these programs. The PART completed for the 2004 Budget found that GAP lacked long-term and efficiency measures but had adequate annual measures. Accordingly, for the 2005 Budget the program developed adequate long-term and efficiency measures. Performance targets for the annual and efficiency measures are still under development.

Additional findings include:
1. Program managers and partners are not held accountable for program performance.
2. Regular independent evaluations are needed.

In response to these findings:
1. EPA will develop ambitious performance targets for its annual and efficiency measures.
2. EPA will improve the program's accountability.

Program Funding Level (in millions of dollars)

2003 Actual	2004 Estimate	2005 Estimate
57	62	62

BIOGRAPHY FOR PAUL GILMAN

In April 2002, Dr. Gilman was sworn-in to serve as the Assistant Administrator for the Office of Research and Development which is the scientific and technological arm of the Environmental Protection Agency. In May 2002, he was appointed the Agency Science Advisor. In this capacity, he will be responsible for working across the Agency to ensure that the highest quality science is better integrated into the Agency's programs, policies and decisions.

Before his confirmation, he was Director, Policy Planning for Celera Genomics in Rockville, Maryland. Celera Genomics, a bio information and drug discovery company, is known for having decoded the human genome. In his position Dr. Gilman was responsible for strategic planning for corporate development and communications.

Prior to joining Celera, Dr. Gilman was the Executive Director of the life sciences and agriculture divisions of the National Research Council of the National Academies of Sciences and Engineering. The National Research Council is the operating arm of the National Academies which were chartered to provide independent advice to the government in matters of science and engineering. Dr. Gilman's divisions focused on risks to health and the environment, protection and management of biotic resources, and practical applications of biology including biotechnology and agriculture.

Before joining the National Research Council, Gilman was the Associate Director of the Office of Management and Budget (OMB) for Natural Resources, Energy, and Science. There he coordinated budget formulation, regulatory, and legislative activities between agencies such as the Environmental Protection Agency, National Science Foundation, Agriculture, and Energy with the Executive Office of the President.

Dr. Gilman served as Executive Assistant to the Secretary of Energy for technical matters before joining the OMB. His responsibilities included participating in policy deliberations and tracking implementation of a variety of programs including the Department's environmental remediation and basic science research.

Gilman has 13 years of experience working on the staff of the United States Senate. He began that time as a Congressional Science Fellow sponsored by the American Association for the Advancement of Science in the office of Senator Pete V. Domenici. Later, as the Staff Director of the Subcommittee on Energy Research and Development, he was involved in the passage of the Nuclear Waste Policy Act of 1982 and oversight of energy technology and environmental research. Later he served as the chief-of-staff for Senator Domenici.

Dr. Gilman matriculated at Kenyon College in Ohio and received his A.B., M.A., and Ph.D. degrees in ecology and evolutionary biology from Johns Hopkins University, Baltimore, Maryland.

Chairman EHLERS. Thank you.

Mr. Posner.

STATEMENT OF MR. PAUL L. POSNER, MANAGING DIRECTOR, FEDERAL BUDGET AND INTERGOVERNMENTAL RELATIONS, GENERAL ACCOUNTING OFFICE

Mr. POSNER. Thank you, Mr. Chairman.

My purpose at this hearing is to talk about the report we did on the OMB PART and performance budgeting more in general. PART is really a new chapter in a long history, some would argue checkered history of performance budgeting, trying to apply performance to budgeting which is inherently in political process. One of the lessons we have learned from the failures of PPB, ZBB and OMB is it is a fool's errant. In fact, however, the fact that we keep trying suggest we won't accept failure for an answer because it is too important to try to link what we are trying to get out of these programs with our resource allocation. This is really the essence of what government should be about. GPRA has, in fact, stayed around much longer than its predecessors. We just issued a report today on that, showing that in fact for 10 years, it has sustained

itself and built a credible supply for information and improved planning.

What PART does is take that supply and attempt to more actively prompt decision-makers to use the information. Our review of the process in fiscal year 2004 suggests that PART succeeded in more explicitly developing linkages between performance and budgeting. It more transparently informed budget decisions than we have seen before. There is more public transparency about the results of the process. Having said that, there is not a direct link with funding, nor should there be, because budgeting is an exercise in political choice and priorities of which performance is but one input. In fact, what we really should expect performance budgeting to do is not change the answers in some mechanical way, but to change the kind of questions we ask. And in fact, this hearing is a very good example of what we are talking about, and I would like to see this in other areas. The focus we should have in our budget debate is what do we know about programs? What more should we know? What should we change in the metrics and the kinds of goals that we are setting for these programs? This is actually exactly what performance budgeting should be all about, what you are doing today in this hearing.

Having said this, doing this is not easy. Developing a bottom line of federal programs is not easy. We are not a private sector business, where we have one profit and loss statement. We have multiple goals for every program, and it is really difficult to assign a single rating to various kinds of balanced portfolios or programs. So judgment is always required, regardless of what the number says. OMB has tried, in the development of the PART instrument and the application, to provide more consistency among its raters, among OMB staff and agency people. Some terms will inherently be subjective and require judgment; things like what constitutes an ambitious performance goal. We found inconsistencies in such things as defining what is an outcome versus an output in evaluating agencies.

The format of the PART tool itself, with the yes, no kinds of answers for most questions, force some standardizations for areas where ultimately considerable judgment was required to balance answers across multiple criteria. The chronic lack of performance in evaluation across many programs, which we have long identified, remains a considerable barrier in doing this exercise, and one thing that we think PART may in fact instigate and instill is a greater incentive to get more of this done. Particular challenges, as you will note today in research and development, in terms of the basic nature of research, makes it more difficult. It takes time to really assess what we are getting out of research. Research itself, particularly basic research, is an uncertain enterprise. But these challenges are being addressed in agencies across the board, and we think the National Academy of Sciences has provided useful criteria.

One important issue that remains—and when you try to judge multiple programs—is defining what a program is. It is arguably seemingly something that we should all know, but there is no uniform definition of what a program is, and so this question of what is the unit analysis for defining what a program is, is critical in

terms of defining what we are getting out of government. This was an issue with GPRA, frankly, and the National Academy of Science report identified this, and it is clearly an issue with PART. Programs were defined one way for GPRA, for example, in more strategic ways. Under PART we are redefining programs for budget purposes in a more discrete, granular way. These are two different competing kinds of accountability mechanisms, and one issue we surfaced is the need to better synchronize between the two.

Ultimately, we recommended continued improvement in the guidance and the rating tool by OMB. We recommended a more targeted selection process so that, in the future, related programs can be grouped together so we can look across different programs and see what we are getting. We recommended early consultation with the Congress, and most importantly, we suggested that Congress develop a process to better identify its performance issues and oversight priorities to enable it to better communicate with OMB and move this process forward.

Thank you.

[The prepared statement of Mr. Posner follows:]

PREPARED STATEMENT OF PAUL L. POSNER

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss performance budgeting and the Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART). Since the 1950s, the Federal Government has attempted several government-wide initiatives designed to better align spending decisions with expected performance—what is commonly referred to as "performance budgeting." The consensus is that prior efforts—including the Hoover Commission, the Planning-Programming-Budgeting-System, Management by Objectives, and Zero-Based Budgeting—did not succeed in significantly shifting the focus of the federal budget process from its long-standing concentration on the items of government spending to the results of its programs. However, the persistent attempts reflect a long-standing interest in linking resources to results.

In the 1990s, Congress and the executive branch laid out a statutory and management framework that provides the foundation for strengthening government performance and accountability, with the Government Performance and Results Act of 1993[1] (GPRA) as its centerpiece. GPRA is designed to inform congressional and executive decision-making by providing objective information on the relative effectiveness and efficiency of federal programs and spending. A key purpose of the act is to create closer and clearer links between the process of allocating scarce resources and the expected results to be achieved with those resources. We have learned that this type of integration is critical from prior initiatives that failed in part because they did not prove to be relevant to budget decision-makers in the executive branch or Congress.[2] GPRA requires both a connection to the structures used in congressional budget presentations and consultation between the executive and legislative branches on agency strategic plans; this gives Congress an oversight stake in GPRA's success.[3]

This administration has made the integration of performance and budget information one of five government-wide management priorities under the President's Management Agenda (PMA).[4] Central to this initiative is PART. OMB developed PART as a diagnostic tool meant to provide a consistent approach to evaluating federal programs and applied it in formulating the President's fiscal years 2004 and 2005

[1] Pub. L. No. 103–62 (1993).

[2] U.S. General Accounting Office, *Performance Budgeting: Past Initiatives Offer Insights for GPRA Implementation,* GAO/AIMD–97–46 (Washington, D.C.: Mar. 27, 1997).

[3] See Pub. L. No. 103–62 §2 (1993), 5 U.S.C. §306 (2003), and 31 U.S.C. §§1115–1116 (2003).

[4] In addition to budget and performance integration, the other four priorities under the PMA are strategic management of human capital, expanded electronic government, improved financial performance, and competitive sourcing.

budget requests. PART covers four broad topics for all "programs"[5] selected for review: (1) program purpose and design, (2) strategic planning, (3) program management, and (4) program results (i.e., whether a program is meeting its long-term and annual goals) as well as additional questions that are specific to one of seven mechanisms or approaches used to deliver the program.[6]

GPRA expanded the supply of performance information generated by federal agencies, although as the PART assessments demonstrate, more must be done to develop credible performance information. However, improving the supply of performance information is in and of itself insufficient to sustain performance management and achieve real improvements in management and program results. Rather, it needs to be accompanied by a demand for that information by decision-makers and managers alike. PART may mark a new chapter in performance-based budgeting by more successfully stimulating demand for this information—that is, using the performance information generated through GPRA's planning and reporting processes to more directly feed into executive branch budgetary decisions.

My statement today focuses on seven points:

- PART helped structure OMB's use of performance information for its internal program and budget analysis, made the use of this information more transparent, and stimulated agency interest in budget and performance integration. Moreover, it illustrated the potential to build on GPRA's foundation to more actively promote the use of performance information in budget decisions.
- The goal of PART is to evaluate programs systematically, consistently, and transparently. OMB went to great lengths to encourage consistent application of PART in the evaluation of government programs, including pilot testing the instrument, issuing detailed guidance, and conducting consistency reviews. Although there is undoubtedly room for continued improvement, any tool is inherently limited in providing a single performance answer or judgment on complex federal programs with multiple goals.
- Performance measurement challenges in evaluating complex federal programs make it difficult to meaningfully interpret a bottom-line rating. The individual section ratings for each PART review provided a better understanding of areas needing improvement than the overall rating alone.
- As is to be expected with any new reform, PART is a work in progress and we have noted in our work where OMB might make improvements. Any tool that is sophisticated enough to take into account the complexity of the U.S. government will require some exercise of judgment. Therefore it is not surprising that we found some inconsistencies in OMB staff interpreting and applying PART.
- PART provides an opportunity to more efficiently use scarce analytic resources, to focus decision-makers' attention on the most pressing policy issues, and to consider comparisons and trade-offs among related programs by more strategically targeting PART assessments based on such factors as the relative priorities, costs, and risks associated with related clusters of programs and activities. The first year PART assessments underscored the long-standing gaps in performance and evaluation information throughout the Federal Government. By reaching agreement on areas in which evaluations are most essential, decision-makers can help ensure that limited resources are applied wisely.
- The relationship between PART and its process and the broader GPRA strategic planning process is still evolving. Although PART can stimulate discussion on program-specific performance measurement issues, it is not a substitute for GPRA's strategic, longer-term focus on thematic goals and department- and government-wide crosscutting comparisons. PART and GPRA serve different but complementary needs, so a strategy for integrating the two could help strengthen both.
- Federal programs are designed and implemented in dynamic environments where competing program priorities and stakeholders' needs must be balanced continually and new needs must be addressed. While PART clearly

[5] There is no standard definition for the term "program." For purposes of PART, OMB described the unit of analysis (program) as (1) an activity or set of activities clearly recognized as a program by the public, OMB, or Congress; (2) having a discrete level of funding clearly associated with it; and (3) corresponding to the level at which budget decisions are made.

[6] The seven major categories are competitive grants, block/formula grants, capital assets and service acquisition programs, credit programs, regulatory-based programs, direct federal programs, and research and development programs.

serves the needs of OMB in budget formulation, questions remain about whether it serves the various needs of other key stakeholders. If the President or OMB wants PART and its results to be considered in the congressional debate, it will be important for OMB to (1) involve congressional stakeholders early in providing input on the focus of the assessments; (2) clarify any significant limitations in the assessments as well as the underlying performance information; and (3) initiate discussions with key congressional committees about how they can best take advantage of and leverage PART information in congressional authorization, appropriations, and oversight processes. Moreover, Congress needs to consider ways it can articulate its oversight priorities and performance agenda.

My statement is based on our recently published report on OMB's PART[7] in which we reviewed the first year of the PART process—fiscal year 2004—and changes in the PART process initiated for fiscal year 2005. We have not reviewed or analyzed the PART results for the fiscal year 2005 budget request. For this testimony, this subcommittee asked us to discuss our overall findings and recommendations concerning PART to help frame today's hearing. We conducted our work in accordance with generally accepted government auditing standards.

Strengths and Weaknesses of PART in Its First Year of Implementation

Through its development and use of PART, OMB has more explicitly infused performance information into the budget formulation process; increased the attention paid to performance information and program evaluations; and ultimately, we hope, increased the value of this information to decision-makers and other stakeholders. By linking performance information to the budget process, OMB has provided agencies with a powerful incentive for improving both the quality and availability of performance information. The level of effort and involvement by senior OMB officials and staff clearly signals the importance of this strategy in meeting the priorities outlined in the PMA. OMB should be credited with opening up for scrutiny—and potential criticism—its review of key areas of federal program performance and then making its assessments available to a potentially wider audience through its Web site.

As OMB and others recognize, performance is not the only factor in funding decisions. Determining priorities—including funding priorities—is a function of competing values and interests. Accordingly, we found that while PART scores were generally positively related to proposed funding changes in discretionary programs, the scores did not automatically determine funding changes. That is, for some programs rated "effective" or "moderately effective" OMB recommended funding decreases, while for several programs judged to be "ineffective" OMB recommended additional funding in the President's budget request with which to implement changes. In fact, the more important role of PART was not its use in making resource decisions, but in its support for recommendations to improve program design, assessment, and management. Our analysis of the fiscal year 2004 PART found that 82 percent of the recommendations addressed program assessment, design, and management issues; only 18 percent of the recommendations had a direct link to funding matters.[8]

OMB's ability to use PART to identify and address future program improvements and measure progress—a major purpose of PART—depends on its ability to oversee the implementation of PART recommendations. As OMB has recognized, following through on these recommendations is essential for improving program performance and ensuring accountability. Currently, OMB plans to assess an additional 20 percent of all federal programs annually. As the number of recommendations from previous years' evaluations grows, a system for monitoring their implementation will become more critical. However, OMB does not have a centralized system to oversee the implementation of such recommendations or evaluate their effectiveness.

The goal of PART is to evaluate programs systematically, consistently, and transparently. OMB went to great lengths to encourage consistent application of PART in the evaluation of government programs, including pilot testing the instrument, issuing detailed guidance, and conducting consistency reviews. Although there is undoubtedly room for continued improvement, any tool is inherently limited in providing a single performance answer or judgment on complex federal programs with multiple goals.

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[7] U.S. General Accounting Office, *Performance Budgeting:Observations on the Use of OMB's Program Assessment Rating Tool for the Fiscal Year 2004 Budget,* GAO–04–174 (Washington, D.C.: Jan. 30, 2004).

[8] The 234 programs assessed for fiscal year 2004 contained a total of 612 recommendations.

OMB recognized the complexity inherent in evaluating federal programs by differentiating its rating tool for seven mechanisms or approaches used to deliver services, ranging from block grants to research and development. However, judgment is involved in classifying programs by these categories since many programs fit into more than one of these groupings. OMB guidance, for instance, acknowledges that some research and development programs can also be evaluated as competitive grants and capital assets.

Performance measurement challenges in evaluating complex federal programs make it difficult to meaningfully interpret a bottom-line rating. OMB published both a single, bottom-line rating for PART results and individual section scores. It is these latter scores that are potentially more useful for identifying information gaps and program weaknesses. For example, in the fiscal year 2004 PART, one program that was rated "adequate" overall got high scores for purpose (80 percent) and planning (100 percent), but poor scores in being able to show results (39 percent) and in program management (46 percent). In a case like this, the individual section ratings provided a better understanding of areas needing improvement than the overall rating alone. In addition, bottom-line ratings may force raters to choose among several important but disparate goals and encourage a determination of program effectiveness even when performance data are unavailable, the quality of those data is uneven, or they convey a mixed message on performance.

Any tool that is sophisticated enough to take into account the complexity of the U.S. government will always require some interpretation and judgment. Therefore it is not surprising that OMB staff were not fully consistent in interpreting complex questions about agency goals and results. Many PART questions contain subjective terms that are open to interpretation. Examples include terminology such as "ambitious" in describing sought-after performance measures. Because the appropriateness of a performance measure depends on the program's purpose, and because program purposes can vary immensely, an ambitious goal for one program might be unrealistic for a similar but more narrowly defined program. Without further guidance, it is unclear how OMB staff can be expected to be consistent.

We also found inconsistencies in how the definition of acceptable performance measures was applied. Our review of the fiscal year 2004 PART surfaced several instances in which OMB staff inconsistently defined appropriate measures—outcome versus output—for programs. Agency officials also told us that OMB staff used different standards to define measures as outcome-oriented. Outputs are the products and services delivered by the program whereas outcomes refer to the results of outputs. For example, in the employment and training area, OMB accepted short-term outcomes, such as obtaining high school diplomas or employment, as a proxy for long-term goals for the Department of Health and Human Services' Refugee Assistance program, which aims to help refugees attain economic self-sufficiency as soon as possible. However, OMB did not accept the same employment measure as a proxy for long-term goals for the Department of Education's Vocational Rehabilitation program because it had not set long-term targets beyond a couple of years. In other words, although neither program contained long-term outcomes, such as participants gaining economic self-sufficiency, OMB accepted short-term outcomes in one instance but not the other.

The yes/no format employed throughout most of the PART questionnaire resulted in oversimplified answers to some questions. Although OMB believes it helped standardization, the yes/no format was particularly troublesome for questions containing multiple criteria for a "yes" answer. Agency officials have commented that the yes/no format can oversimplify reality, in which progress in planning, management, or results is more likely to resemble a continuum than an on/off switch. Our review of the fiscal year 2004 PART found several instances in which some OMB staff gave a "yes" answer for successfully achieving some but not all of the multiple criteria, while others gave a "no" answer when presented with a similar situation. For example, OMB judged the Department of the Interior's (DOI) Water Reuse and Recycling program "no" on whether a program has a limited number of ambitious, long-term performance goals, noting that although DOI set a long-term goal of 500,000 acre-feet per year of reclaimed water, it failed to establish a time frame for when it would reach the target. However, OMB judged the Department of Agriculture's and DOI's Wildland Fire programs "yes" on this question even though the programs' long-term goals of improved conditions in high-priority forest acres are not accompanied by specific time frames.

The lack of program performance information also creates challenges in effectively assessing program performance. According to OMB, about half of the programs assessed for fiscal year 2004 lacked "specific, ambitious long-term performance goals that focus on outcomes" and nearly 40 percent lacked sufficient "independent, quality evaluations." Nearly 50 percent of programs assessed for fiscal year 2004 re-

ceived ratings of "results not demonstrated" because OMB decided that program performance information, performance goals, or both were insufficient or inadequate. While the validity of these assessments may be subject to interpretation and debate, our previous work[9] has raised concerns about the capacity of federal agencies to produce evaluations of program effectiveness as well as credible data.

In our report on PART, we note that several factors have limited the availability of performance data and evaluations of federal programs, including the lack of statutory mandates and funding to support data collection and analysis. Our work has recognized that research programs pose particular and long-standing challenges for performance assessments and evaluations.[10] For instance, in both applied and basic research, projects take several years to complete and require more time before their meaning for the field can be adequately understood and captured in performance reporting systems. These challenges can and have been addressed by federal and private research organizations. One evaluation approach we have identified in our review of leading practices is the use of peer review to evaluate the quality of research outcomes.[11] For example, the National Science Foundation (NSF) convenes panels of independent experts as external advisers—a Committee of Visitors (COV)—to peer review the technical and managerial stewardship of a specific program or cluster of programs periodically. The COV compares research plans with progress made, and evaluates outcomes to determine whether the research contributes to NSF mission and goals.

The Relationship between GPRA and PART

PART was designed for and is used in the executive branch budget preparation and review process. As a result, the goals and measures used in PART must meet OMB's needs. By comparison, GPRA—the current statutory framework for strategic planning and reporting—is a broader process involving the development of strategic and performance goals and objectives to be reported in strategic and annual plans and reports. OMB said that GPRA plans were organized at too high a level to be meaningful for program-level budget analysis and management review. OMB acknowledges that GPRA was the starting point for PART, but as I will explain, it appears that OMB's emphasis is shifting such that over time the performance measures developed for PART and used in the budget process may also come to drive agencies' strategic planning processes.

The fiscal year 2004 PART process came to be a parallel competing structure to the GPRA framework as a result of OMB's desire to collect performance data that better align with budget decision units. OMB's most recent Circular A–11 guidance clearly requires both that each agency submit a performance budget for fiscal year 2005 and that this should replace the annual GPRA performance plan.[12] These performance budgets are to include information from the PART assessments, where available, including all performance goals used in the assessment of program performance done under the PART process. Until all programs have been assessed using PART, the performance budget will also include performance goals for agency programs that have not yet been assessed. OMB's movement from GPRA to PART is further evident in the fiscal year 2005 PART guidance stating that while existing GPRA performance goals may be a starting point during the development of PART performance goals, the GPRA goals in agency GPRA documents are to be revised, as needed, to reflect OMB's instructions for developing the PART performance goals. Lastly, this same guidance states that GPRA plans should be revised to include any new performance measures used in PART and that unnecessary measures should be deleted from GPRA plans. In its comments to another recently issued GAO report, OMB stated that it will revise its guidance for both GPRA and PART to clarify the integrated and complementary relationship between the two initiatives.[13]

Although there is potential for complementary approaches to GPRA and PART, the following examples clearly illustrate the importance of carefully considering the implications of selecting a unit of analysis, including its impact on the availability of performance data. They also reveal some of the unresolved tensions between the President's budget and performance initiative—a detailed budget perspective—and

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[9] U.S. General Accounting Office, *Program Evaluation: Agencies Challenged by New Demand for Information on Program Results,* GAO/GGD–98–53 (Washington, D.C.: Apr. 24, 1998).

[10] U.S. General Accounting Office, *Transportation Research: Actions Needed to Improve Coordination and Evaluation of Research,* GAO–03–500 (Washington, D.C.: May 1, 2003).

[11] U.S. General Accounting Office, *Program Evaluation: An Evaluation Culture and Collaborative Partnerships Help Build Agency Capacity,* GAO–03–454 (Washington, D.C.: May 2, 2003).

[12] OMB Circular A–11, *Preparation, Submission, and Execution of the Budget.*

[13] U.S. General Accounting Office, *Results-Oriented Government: GPRA Has Established a Solid Foundation for Achieving Greater Results,* GAO–04–38 (Washington, D.C.: March 10, 2004).

GPRA—a more strategic planning view. Experience with PART highlighted the fact that defining a "unit of analysis" useful for both program-level budget analysis and agency planning purposes can be difficult. For example, disaggregating programs for PART purposes could ignore the interdependence of programs recognized by GPRA by artificially isolating programs from the larger contexts in which they operate. Agency officials described one program assessed with the fiscal year 2004 PART—Projects for Assistance in Transition from Homelessness—that was aimed at a specific aspect of homelessness, that is, referring persons with emergency needs to other agencies for housing and needed services. OMB staff wanted the agency to produce long-term outcome measures for this program to support the PART review process. Agency officials argued that chronically homeless people require many services and that this federal program often supports only some of the services needed at the initial stages of intervention. GPRA—with its focus on assessing the relative contributions of related programs to broader goals—is better designed to consider crosscutting strategies to achieve common goals. Federal programs cannot be assessed in isolation. Performance also needs to be examined from an integrated, strategic perspective.

One way of improving the links between PART and GPRA would be to develop a more strategic approach to selecting and prioritizing areas for assessment under the PART process. Targeting PART assessments based on such factors as the relative priorities, costs, and risks associated with related clusters of programs and activities addressing common strategic and performance goals not only could help ration scarce analytic resources but also could focus decision-makers' attention on the most pressing policy and program issues. Moreover, such an approach could facilitate the use of PART assessments to review the relative contributions of similar programs to common or crosscutting goals and outcomes established through the GPRA process.

The Importance of Congressional and Other Stakeholder Involvement

We have previously reported[14] that stakeholder involvement appears critical for getting consensus on goals and measures. In fact, GPRA requires agencies to consult with Congress and solicit the views of other stakeholders as they develop their strategic plans.[15] Stakeholder involvement can be particularly important for federal agencies because they operate in a complex political environment in which legislative mandates are often broadly stated and some stakeholders may strongly disagree about the agency's mission and goals.

The relationship between PART and its process and the broader GPRA strategic planning process is still evolving. As part of the executive branch budget formulation process, PART must clearly serve the President's interests. Some tension about the amount of stakeholder involvement in the internal deliberations surrounding the development of PART measures and the broader consultations more common to the GPRA strategic planning process is inevitable. Compared to the relatively open-ended GPRA process, any budget formulation process is likely to seem closed.

Yet, we must ask whether the broad range of congressional officials with a stake in how programs perform will use PART assessments unless they believe the reviews reflect a consensus about performance goals among a community of interests, target performance issues that are important to them as well as the administration, and are based on an evaluation process in which they have confidence. Similarly, the measures used to demonstrate progress toward a goal, no matter how worthwhile, cannot serve the interests of a single stakeholder or purpose without potentially discouraging use of this information by others.

Congress has a number of opportunities to provide its perspective on performance issues and performance goals, such as when it establishes or reauthorizes a new program, during the annual appropriations process, and in its oversight of federal operations. In fact, these processes already reflect GPRA's influence. Reviews of language in public laws and committee reports show an increasing number of references to GPRA-related provisions. What is missing is a mechanism to systematically coordinate a congressional perspective and promote a dialogue between Congress and the President in the PART review process.

In our report, we have suggested steps for both OMB and the Congress to take to strengthen the dialogue between executive officials and congressional stakeholders. We have recommended that OMB reach out to key congressional committees early in the PART selection process to gain insight about which program areas and performance issues congressional officials believe warrant PART review. Engag-

[14] U.S. General Accounting Office, *Agencies' Strategic Plans Under GPRA: Key Questions to Facilitate Congressional Review (Version 1),* GAO/GGD–10.1.16 (Washington, D.C.: May 1997).
[15] 5 U.S.C. §306(d) (2003).

ing Congress early in the process may help target reviews with an eye toward those areas most likely to be on the agenda of Congress, thereby better ensuring the use of performance assessments in resource allocation processes throughout government. We have also suggested that Congress consider the need to develop a more systematic vehicle for communicating its top performance concerns and priorities; develop a more structured oversight agenda to prompt a more coordinated congressional perspective on crosscutting performance issues; and use this agenda to inform its authorization, appropriations, and oversight processes.

Concluding Observations

The PART process is the latest initiative in a long-standing series of reforms undertaken to improve the link between performance information and budget decisions. Although each of the initiatives of the past appears to have met with an early demise, in fact, subsequent reforms were strengthened by building on the legacy left by their predecessors. Prior reforms often failed because they were not relevant to resource allocation and other decision-making processes, thereby eroding the incentives for federal agencies to improve their planning, data, and evaluations.

Unlike many of those past initiatives, GPRA has been sustained since its passage 10 years ago, and evidence exists that it has become more relevant than its predecessors. PART offers the potential to build on the infrastructure of performance plans and information ushered in by GPRA and the law's intent to promote the use of these plans in resource allocation decision-making. GPRA improved the supply of plans and information, while PART can prompt greater demand for this information by decision-makers. Enhancing interest and use may bring about greater incentives for agencies to devote scarce resources to improving their information and evaluations of federal programs as well.

Increasing the use and usefulness of performance data is not only important to sustain performance management reforms, but to improve the processes of decision-making and governance. Many in the United States believe there is a need to establish a comprehensive portfolio of key national performance indicators. This will raise complex issues ranging from agreement on performance areas and indicators to getting and sharing reliable information for public planning, decision-making, and accountability. In this regard, the entire agenda of management reform at the federal level has been focused on shifting the attention of decision-makers and agency management from process to results. Although PART is based on changing the orientation of budgeting, other initiatives championed by Congress and embodied in the PMA are also devoted to improving the accountability for performance goals in agency human capital management, financial management, competitive sourcing, and other key management areas.

In particular, we have reported that human capital—or people—is at the center of any serious change management initiative. Thus, strategic human capital management is at the heart of government transformation. High-performing organizations strengthen the alignment of their GPRA strategic and performance goals with their daily operations. In that regard, performance management systems can be a vital tool for aligning an organization's operations with individual day-to-day activities, but they are currently largely unused. As we move forward to strengthen government performance and accountability, effective performance management systems can be a strategic tool to drive internal change and achieve desired results.

The question now is how to enhance the credibility and use of the PART process as a tool to focus decisions on performance. In our report, we make seven recommendations to OMB and a suggestion to Congress to better support the kind of collaborative approach to performance budgeting that very well may be essential in a separation of powers system like ours. Our suggestions cover several key issues that need to be addressed to strengthen and help sustain the PART process. We recommend that the OMB Director take the following actions:

- Centrally monitor agency implementation and progress on PART recommendations and report such progress in OMB's budget submission to Congress. Government-wide councils may be effective vehicles for assisting OMB in these efforts.
- Continue to improve the PART guidance by (1) expanding the discussion of how the unit of analysis is to be determined to include trade-offs made when defining a unit of analysis, implications of how the unit of analysis is defined, or both; (2) clarifying when output versus outcome measures are acceptable; and (3) better defining an "independent, quality evaluation."
- Clarify OMB's expectations to agencies regarding the allocation of scarce evaluation resources among programs, the timing of such evaluations, as well as the evaluation strategies it wants for PART, and consider using internal

agency evaluations as evidence on a case-by-case basis—whether conducted by agencies, contractors, or other parties.

- Reconsider plans for 100 percent coverage of federal programs and, instead, target for review a significant percentage of major and meaningful government programs based on such factors as the relative priorities, costs, and risks associated with related clusters of programs and activities.
- Maximize the opportunity to review similar programs or activities in the same year to facilitate comparisons and trade-offs.
- Attempt to generate, early in the PART process, an ongoing, meaningful dialogue with congressional appropriations, authorization, and oversight committees about what they consider to be the most important performance issues and program areas that warrant review.
- Seek to achieve the greatest benefit from both GPRA and PART by articulating and implementing an integrated, complementary relationship between the two.

In its comments on our report, OMB outlined actions it is taking to address several of these recommendations, including refining the process for monitoring agencies' progress in implementing the PART recommendations, seeking opportunities for dialogue with Congress on agencies' performance, and continuing to improve executive branch implementation of GPRA plans and reports.

Our recommendations to OMB are partly directed at fortifying and enhancing the credibility of PART itself and the underlying data used to make the judgments. Decision makers across government are more likely to rely on PART data and assessments if the underlying information and the rating process are perceived as being credible, systematic, and consistent. Enhanced OMB guidance and improved strategies for obtaining and evaluating program performance data are vital elements.

The PART process can be made more sustainable if the use of analytic resources at OMB and the agencies is rationalized by reconsidering the goal of 100 percent coverage of all federal programs. Instead, we suggest a more strategic approach to target assessments on related clusters of programs and activities. A more targeted approach stands a better chance of capturing the interest of decision-makers throughout the process by focusing their attention on the most pressing policy and program issues and on how related programs and tools affect broader crosscutting outcomes and goals. Unfortunately, the government-wide performance plan required by GPRA has never been engaged to drive budgeting in this way.

Improving the integration of inherently separate but interrelated strategic planning and performance budgeting processes can help support a more strategic focus for PART assessments. GPRA's strategic planning goals could be used to anchor the selection and review of programs by providing a foundation to assess the relative contribution of related programs and tools to broader performance goals and outcomes.

Finally, refining the PART questionnaire and review process and improving the quality of data are important, but the question of whose interests drive the process is perhaps paramount in our system. Ultimately, the impact of PART on decision-making will be a function not only of the President's decisions, but of congressional decisions as well.

Much is at stake in the development of a collaborative performance budgeting process. Not only might the PART reviews ultimately come to be disregarded absent congressional involvement, but more important, Congress will lose an opportunity to use the PART process to improve its own decision-making and oversight processes.

This is an opportune time for the executive branch and Congress to carefully consider how agencies and committees can best take advantage of and leverage the new information and perspectives coming from the reform agenda under way in the executive branch. Ultimately, the specific approach or process is not important. We face a long-term fiscal imbalance, which will require us to re-examine our existing policies and programs. It is all too easy to accept "the base" as given and to subject only new proposals to scrutiny and analysis. The norm should be to reconsider the relevance or "fit" of any federal program, policy, or activity in today's world and for the future.

Mr. Chairman, this concludes my prepared statement. I would be pleased to answer any questions you or the other Members of the Subcommittee may have at this time.

GAO
Accountability · Integrity · Reliability

Highlights

Highlights of GAO-04-550T, a testimony before the Subcommittee on Environment, Technology, and Standards, Committee on Science, House of Representatives

Why GAO Did This Study

The Office of Management and Budget's (OMB) Performance Assessment Rating Tool (PART) is meant to provide a consistent approach to evaluating federal programs during budget formulation. The subcommittee asked GAO to discuss its overall findings and recommendations concerning PART, based on a recent report, *Performance Budgeting: Observations on the Use of OMB's Program Assessment Rating Tool for the Fiscal Year 2004 Budget* (GAO-04-174).

What GAO Recommends

In the recent report on PART, GAO recommended that the Director of OMB (1) address the capacity demands of PART, (2) strengthen PART guidance, (3) address evaluation information scope and availability issues, (4) focus program selection on critical operations and crosscutting comparisons, (5) expand the dialogue with Congress, and (6) articulate and implement a complementary relationship between PART and GPRA.

OMB generally agreed with GAO's findings, conclusions, and recommendations and said it is already taking actions to address many of the recommendations.

GAO also suggested that Congress consider the need for a structured approach to articulating its perspective and oversight agenda on performance goals and priorities for key programs.

www.gao.gov/cgi-bin/getrpt?GAO-04-550T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Paul L. Posner at (202) 512-9573 or posnerp@gao.gov.

March 11, 2004

PERFORMANCE BUDGETING

OMB's Program Assessment Rating Tool Presents Opportunities and Challenges for Evaluating Program Performance

What GAO Found

PART helped structure OMB's use of performance information for internal program and budget analysis and stimulated agency interest in budget and performance integration. Moreover, it illustrated the potential to build on GPRA's foundation to more actively promote the use of performance information in budget decisions. OMB deserves credit for inviting scrutiny of its federal program performance reviews and sharing them on its Web site.

The goal of PART is to evaluate programs systematically, consistently, and transparently. OMB went to great lengths to encourage consistent application of PART in the evaluation of government programs, including pilot testing the instrument, issuing detailed guidance, and conducting consistency reviews. Although there is undoubtedly room for continued improvement, any tool is inherently limited in providing a single performance answer or judgment on complex federal programs with multiple goals.

Performance measurement challenges in evaluating complex federal programs make it difficult to meaningfully interpret a single bottom-line rating. The individual section ratings for each PART review provided a better understanding of areas needing improvement than the overall rating alone. Moreover, any tool that is sophisticated enough to take into account the complexity of the U.S. government will always require some interpretation and judgment. Therefore it is not surprising that OMB staff were not fully consistent in interpreting complex questions about agency goals and results.

The lack of program performance information at the agency level also creates challenges in effectively measuring program performance. PART provides an opportunity to consider strategically targeting the assessments on groups of related programs contributing to common outcomes to more efficiently use scarce analytic resources and focus decision makers' attention on the most pressing performance issues cutting across individual programs and agencies.

The relationship between PART and the broader GPRA strategic planning process is still evolving and highlights the critical importance of defining the unit of analysis for program evaluation. Although PART can stimulate discussion on program-specific performance measurement issues, it is not a substitute for GPRA's strategic, longer-term focus on thematic goals, and department- and governmentwide crosscutting comparisons.

PART clearly serves OMB's needs, but questions remain about whether it serves the various needs of other key stakeholders. If PART results are to be considered in the congressional debate, it will be important for OMB to (1) involve congressional stakeholders early in providing input on the focus of the assessments; (2) clarify any significant limitations in the assessments and underlying performance information; and (3) initiate discussions with key congressional committees about how they can best leverage PART information in congressional authorization, appropriations, and oversight processes.

Chairman EHLERS. Dr. Matanoski.

STATEMENT OF DR. GENEVIEVE MATANOSKI, PROFESSOR, DEPARTMENT OF EPIDEMIOLOGY, JOHNS HOPKINS UNIVERSITY; CHAIR, EPA SCIENCE ADVISORY BOARD REVIEW OF EPA'S FISCAL YEAR 2005 BUDGET; FORMER CHAIR, EPA SCIENCE ADVISORY BOARD

Dr. MATANOSKI. Good morning, Mr. Chairman and Members of the Subcommittee on Environment, Technology and Standards.

My name is Genevieve Matanoski. I am honored to appear before you today to present the views of the Science Advisory Board for EPA regarding their Fiscal Year 2005 Science and Research Budget Request. The Board will complete its full report by March 19, 2004, and with the permission of the Chairman, we will submit that report for the record then.

Over the last year, the Board, under the leadership of its Chairman, Dr. William Glaze, has reorganized to make its advisory function as apparent as its peer-review function. With this reorganization, the Board moved the EPA Science and Research Budget Review from a small standing committee to the entire larger Board, and this has provided great visibility to the review, and it also has increased the expertise available to conduct the evaluation. This Board, in the past years, has noted its deep concern over the constant erosion of EPA's research budget programs. The fiscal year 2005 budget we now observe not only continued the erosion but actually cut funding for research. This continuous decrease in research funding severely constrains the ability of the agency to provide the necessary science to guide informed decision-making, and to assist in reaching the Nation's goals for human health and environmental risk reduction.

In particular, the Board notes, as did the Chairman, substantial cuts in their fiscal year 2005 budget request for EPA's Science to Achieve Results program, STAR. STAR is recognized by this Board as the science program of major importance to the agency. That view is consistent with the views of the National Academy of Science in its review of STAR. STAR provides many benefits to EPA, one of which is the necessary flexibility to obtain critical scientific expertise in a wide range of disciplines that are essential in addressing emerging issues that are outside EPA's current areas of expertise. EPA could never maintain the same large base of scientific expertise that is available on an as-needed basis to carry out specific research. STAR also enhances EPA's collaborations with outside researchers and academic institutions, and in the process actually stimulates additional resources for the agency and its science needs.

STAR also benefits and strengthens scientific research throughout the United States by providing training for graduate students who will reinforce the declining base of engineers and scientists in the United States. Even though STAR is largely focused on EPA's core research, it has begun to accrue a record of early success. Serious budget cuts in STAR are as follows. Ecosystems protection research got a $22 million loss, with a loss of some 50 STAR grants based in many states. That is a serious reduction. Endocrine disruptors' research was cut by five million. Pollution prevention

research, which is—a focus of that research is to avoid future problems. That was cut by five million. And mercury research was cut by another two million. Even the STAR Graduate Fellowship Program, despite its increases, is still $4 million short of what Congress recommended for fiscal year 2003.

The Board believes that these cuts will have a negative impact on the balance research portfolio that EPA has developed over the last decade. In that time, EPA has developed a program that balances its problem-driving, short-term applied research, whatever you want to call it, with its core long-term basic research. Here, the STAR program helps EPA balance its internal and its extramural research portfolios. The result is that science from many different institutions is integrated into a total research program that compliments the scientific niche filled by EPA's own excellent scientists. This provides a more nimble resource that is available to work on existing and emerging environmental issues than would be available with only an intramural program.

Another surprising change as already noted in the budget was EPA's decrease in its commitment to Homeland Security. The Board believes that EPA must play a continuing role in Homeland Security in several areas, and one of these is building contamination, which was cut.

I have run out of time. There are several other issues that we have in our written testimony, one regarding PART and the other regarding the future of research at EPA.

[The prepared statement of Dr. Matanoski follows:]

PREPARED STATEMENT OF GENEVIEVE MATANOSKI

Good morning Mr. Chairman and Members of the Subcommittee on Environment, Technology, and Standards. My name is Genevieve Matanoski. I am honored to appear before you today to present the conclusions of the EPA Science Advisory Board (SAB) on the EPA's FY 2005 Science and Research Budget Request. My comments today will summarize the views of the Board about that request for funding EPA's science and research programs during FY 2005. The Board will complete its full report on this issue by March 19, 2004 and with the permission of the Chairman, will submit that report for the record then.

1. Introductory Remarks

Over the last year the Board, under the leadership of its Chairman, Dr. William Glaze, has reorganized to make its advisory function as apparent as its peer review function. To take advantage of the benefits of this reorganization, the Board moved the EPA Science and Research advisory function from a small standing committee to the larger Board. This enhances the visibility of the review and increases the expertise available to conduct the evaluation. We will also be working with EPA to obtain information on the Agency's science and research programs on a systematic and continuous basis. The Agency now presents information to the Board in ways that correlate with their new Strategic Plan and which will ultimately include all science and research programs regardless of their funding source or where they are conducted within EPA.

2. Specific Comments on EPA's FY 2005 Science and Research Program and Budgets

a. Erosion of the EPA Research Budget

First, I want to mention that in past years, the Board has noted its deep concern with the constant erosion of EPA's research program budgets. For the FY 2005 budget, we now observe not just continued erosion, but a substantial cut to research funding. This continuous decrease in science and research funding severely constrains the ability of the Agency to provide the necessary science to guide informed decision-making and to assist in reaching the Nation's goals for human health and environmental risk reduction. The EPA has an outstanding group of scientists who conduct excellent basic and applied research focused on reducing both recognized

problems such as air pollution, and the continually emerging problems arising from the past misuse of our environment.

b. Cuts to the STAR Program

In particular, the Board notes the substantial cuts in the FY 2005 budget request for EPA's Science to Achieve Results program (STAR). STAR is recognized by this Board as a science program of major importance to the Agency. That view is consistent with the views of the National Academy of Science in its 2003 review entitled "The Measure of STAR." STAR provides many benefits to EPA, including the necessary flexibility to obtain critical scientific expertise in the wide range of disciplines that are essential in addressing emerging issues that are outside EPA's current areas of expertise. EPA could never maintain the same large base of scientific expertise that is available on an as needed basis to carry out specific research. STAR enhances EPA's collaboration with outside researchers and academic institutions and in the process *actually stimulates additional resources for Agency science needs.* STAR also benefits and strengthens scientific research throughout the United States by providing training for graduate students who will reinforce the declining base of engineers and scientists in the U.S. Even though STAR is largely focused on EPA's core research, it has begun to accrue a record of early success. Evidence of this can be found in the NAS's "Measure of STAR" report in which it states that STAR research on endocrine disruptors, and ecologic assessment have already resulted in ". . .peer-reviewed publications that are of immediate use in understanding causes, exposures, and effects of environmental pollution." By any measure, STAR is an excellent investment.

To emphasize the seriousness of this situation, we note a number of cuts to STAR research which are a part of the FY 2005 budget request:

i. *Ecosystems Protection Research* is reduced by over $22 million with a loss of some 50 STAR grants based in many states. The Board is particularly concerned about this cut given the critical need for ecosystems research, which the Board feels is generally under-funded across EPA.

ii. *Endocrine Disruptors Research* is reduced by about $5 million. This is an area of research that investigates the effects that could be associated with use of many chemicals used in large quantities in our society.

iii. *Pollution Prevention Research* is reduced by $5 million even though the focus of this research is on avoiding future problems and reducing the expensive cleanup costs that we face today.

iv. *Mercury Research* is reduced by $2 million, just at the time when more information is needed on this ubiquitous contaminant.

In addition, even though the STAR Graduate Fellowship program increases by $1.2 million over the FY 2004 level, it is still nearly $4 million below the level enacted by Congress for FY 2003 ($9.8 million). This program's aim is to educate the future environmental scientists that will be needed to replace the currently aging population of such scientists. Thus, adequate funding of this program continues to be essential.

The Board believes that these cuts will have a negative impact on the balanced research portfolio that EPA, especially ORD, has developed over the last decade. In that time, EPA has developed a program that balances its problem-driven (shorter-term, applied) research with its core (longer-term, basic) research. Though components of the core program are not always easy to identify in the budget, EPA appears to have a balanced research program, in this regard, with about half being "core" and half being "problem-driven." This seems to be appropriate.

Further, the STAR program helps EPA balance its internal research portfolio with its extramural research portfolio. The result is that science from many different institutions (government, academia, non-governmental organizations, and industry) is integrated into a total research program that complements the scientific niche filled by EPA's own scientists. This provides a more nimble resource that is available to work on existing and emerging environmental issues than would be available with only an intramural or an extramural program. Changes in this budget, especially to STAR, will significantly impair the balance of this integrated research program in both core vs. problem driven and intramural vs. extramural research dimensions.

c. Building Decontamination and Homeland Security

Another surprising change for which no satisfying explanation was offered was EPA's decrease in its commitment to Homeland Security. The Board believes that EPA must play a continuing role in Homeland Security in several areas. EPA's building decontamination research is one of EPA's contributions to Homeland Security and it is being eliminated in an $8.3 million dollar cut prior to its completion.

The Board is unsure as to why research on this important issue is being cut when it appears that further research is needed to provide rapid, on-target responses to contamination episodes. The Board is aware that other agencies have substantial resources devoted to Homeland Security, so perhaps other groups have taken on this role for the future. EPA has the special expertise to carry out this research. However, if it is judged that this is not a research direction for EPA, it is still important to ensure that this work be conducted somewhere.

2. Program Planning and Measurement

a. Program Assessment

Each year, the Board tries to evaluate EPA's research priorities and their role in meeting the Agency's goals. As part of the current review, the Board was given information resulting from the application of a new survey tool, the Program Assessment Rating Tool (PART) that was used to evaluate selected EPA programs. The Board is concerned that decisions are being made about research program funding on the basis of the application of this new tool.

To be clear, the Board did not receive or review information on the rating instrument itself; however, after evaluating PART summaries for several research programs, our conclusion is that PART may, at this time, have a limited capacity to inform budget decisions on research programs. The Board's is concerned with the manner in which the weighting formula in PART seems to influence the full analysis and thus favor programs with short-run results over those having long-term results. There is also concern that an evaluator's subjective considerations might be able to bias those weights and the rating itself.

Specifically, it appears that the weighting formula in the PART favors programs with near-term benefits at the expense of programs with long-term benefits. Since research inevitably involves more long-term benefits and fewer short-term benefits, PART ratings serve to bias the decision-making process against programs such as STAR ecosystem research, global climate change research, and other important subjects. The PART seems to be intended as a formula for predictions about likely program success. However, the weights that the PART assigns to different program characteristics do not seem to have been validated systematically against the contribution of each program characteristic to any independent objective measure of program success. If the weights in the tool are arbitrarily assigned, the PART may have characteristics that could lead to biases in evaluation that are related to the subjective judgments of its designers. We believe that the tool should be reviewed to determine its adequacy for its use in supporting budget decisions.

As the Board observed significant decreases in science and research funding, it also noted a substantial resource increase in the State and Tribal Assistance Grant account (STAG) for an initiative for retrofitting school busses. The Board does not challenge the worthiness of this program, rather it notes that it has no information on the science supporting this initiative. The Board trusts that the benefits of this program have been rigorously reviewed.

The real issue here is how research programs (and others) are to be evaluated and whether a different metric is necessary for basic vs. applied research programs. Also, of interest is whether research results should be evaluated separately from the outcomes of programs they are intended to support? Although the Board did not directly evaluate the PART itself, it is of obvious difficulty to conceive of a simple quantitative metric that could be applied across the broad areas of ecosystem quality, human health effects, endocrine effects, and technology development. The question is even more complex when you consider that some research is intended to develop limited data in the short-run to fill a specific knowledge gap and other research is intended to provide an understanding of whole systems in the long-term. Research program measurement is even more difficult because the knowledge and methods developed by EPA, especially ORD's researchers, are not usually directly applied by ORD, rather they are often used by others to support decisions on a broad suite of diverse statutory mandates. Thus, we believe that evaluations of the performance of research programs will need to consider the specific factors of each program that the research is intended to support. Further, it is unlikely that simple formulas will be able to handle this task well. It is more likely that realistic research program performance assessment will need to be a combination of quantitative metrics and other information and analyses which is then evaluated by groups of experts with relevant knowledge.

I note that the NAS, in its review of STAR, also had concerns with quantitative routines used in performance assessments and noted that "The Committee judges that expert review by a group of people with appropriate expertise is the best method of evaluating broad research programs, such as the STAR program."

b. Multi-Year Plans (MYPs)

Multi-Year Plans (MYPs) are an important innovation in EPA's research planning process. The SAB has reviewed a limited number of these plans and the process used in their development and we believe that they will become more useful to the Board's evaluation of EPA's science and research, and its funding, in the future. MYP's are tools that identify knowledge and methodology gaps needed to support EPA's mission areas and the body of research that would address those needs. Further, they provide a basis for identifying annual performance goals and measures for efforts that become a part of EPA's research budget. Finally, MYPs are very useful in providing focus on long-term progress toward research goals, especially on cross-cutting subjects such as pollution prevention where coordination across the Agency is essential. The Board supports the continued refinement of Multi-Year plans and is available to continue its review of EPA's progress in this regard.

3. EPA Science

My final comment will address an issue of great concern to the Board. Our analyses of EPA's science and research budgets, today and in the past, convince us that the Agency is in danger of underestimating the pace of large scale changes that are now occurring in our society. If so, EPA and the Nation are at risk of repeating the mistakes of the past that force us to spend huge sums of public funds to reduce and to clean up the pollution brought on by the first industrial revolution.

The evidence before us suggests that we are now in a new, high velocity technological revolution that will yield great economic gains, but at the same time, will offer new environmental challenges. Nanotechnology and biotechnology, to name only two innovations, are proceeding with breathtaking speed, and are compounded by forces such as global transfer of pollution and disease, and possible climate change. EPA must carefully examine all of its science and research programs and ask whether the Agency is conducting research that will help us protect human health and the environment while encouraging innovation and growth.

This is not to say that EPA should neglect the "legacy" issues of the past; rather, the Agency must continue to resolve those problems, and at the same time, work with citizen's groups, industry, and academia in creative ways to ensure that the Nation avoids a new legacy of human health and environmental problems.

The Board would be pleased to work with EPA to explicitly address ways in which EPA science and research might be focused to help EPA develop, and use to the fullest, knowledge that will be instrumental in avoiding a negative legacy.

I want to express my gratitude to the Members of the Subcommittee for inviting me to testify about EPA's science and research. I would be pleased to answer your questions.

Thank you.

BIOGRAPHY FOR GENEVIEVE MATANOSKI

Dr. Matanoski is a Professor of Epidemiology at the Johns Hopkins University School of Hygiene and Public Health in Baltimore, MD. For a time after medical school she pursued a career in pediatrics and general preventive medicine. After earning a Doctor of Public Health Degree, she was appointed to the faculty of Johns Hopkins University and has been a professor since 1976. In addition to teaching and research, Dr. Matanoski has had appointments in a number of teaching and training programs in the U.S. and abroad and is a frequent advisor to legislative and policy-making groups. She is a member of several scientific advisory bodies both for governmental agencies and for industry. She is a past Chair of the EPA Science Advisory Board, as well as a past Chair of the SAB Radiation Advisory Committee. She now serves as a member of the Board of the EPA SAB. During her tenure on the EPA SAB, Dr. Matanoski has been involved in the writing of several documents produced to provide advice to EPA including the "Beyond the Horizon: Using Foresight to Protect the Environmental Future" document and the Integrated Risk Project report "Toward Integrated Environmental Decision-making," and was Chair of the latter Committee. She is the author or co-author of over 80 publications.

Dr. Matanoski's work has focused on the epidemiology of cancer, including bladder, lung, skin and uterine cancers, and leukemia. Her research studies have examined the risks associated with occupational and environmental exposures to such agents as radiation, electromagnetic fields, and chemical substances as styrene, butadiene, arsenic and environmental tobacco smoke. Her recent research has emphasized reproductive effects and congenital malformations from environmental exposures. Her early work involved infectious diseases and illnesses in infants and children. Dr. Matanoski received a B.A. degree in chemistry at Radcliffe College and a M.D. at the Johns Hopkins School of Medicine. She also earned a Doctor of Public

Health Degree from the Johns Hopkins University School of Hygiene and Public Health (11/2003).

Chairman EHLERS. Thank you for your testimony.

Dr. Denson.

STATEMENT OF DR. COSTEL D. DENSON, PROFESSOR, DEPARTMENT OF ENGINEERING, UNIVERSITY OF DELAWARE; MEMBER OF THE NATIONAL RESEARCH COUNCIL PANEL REVIEW, THE MEASURE OF STAR: REVIEW OF THE EPA'S SCIENCE TO ACHIEVE RESULTS (STAR) RESEARCH GRANTS PROGRAM

Dr. DENSON. Good morning, Mr. Chairman and Members of the Committee.

My name is Costel Denson. I am a Professor of Chemical Engineering at the University of Delaware, where I have been employed since 1977. I have also served as Vice Provost for Research. In that position, I had oversight of and was responsible for all aspects of the research enterprise at the University. Recently, I served as a member of the National Research Council, the NRC Committee, to review EPA's Research Grants Program. The NRC is the operating arm of the National Academies of Sciences and Engineering. I am pleased to be here to discuss the unanimous findings and recommendations of that committee.

The Environmental Protection Agency is a mission agency established to protect human health and to safeguard the natural environment. EPA's regulatory and decision-making role requires that the agency have access to the best available science that is relevant to its mission. In an effort to improve the scientific foundation of its decision-making process, the agency's Office of Research and Development established the Science to Achieve Results program, the STAR program, as part of its Research Grants Program in 1995.

STAR is a competitive, peer-reviewed, extramural research grants program created to encourage interagency collaboration and to increase EPA's access to the Nation's best scientists and engineers in academic and other non-profit research institutions. It supports research pertaining to human health and the environment and it is designed to maximize the independence of the researchers it supports and to provide an equal opportunity for all researchers to qualify for that support.

Over the past six years, a number of occasions have arisen where I have had the opportunity to review the STAR program. When I was chair of EPA's Office of Research and Development's Board of Scientific Counselors, I oversaw the review that BOSC conducted in 1997 of EPA's National Center for Environmental Research and Quality Assurance, and the STAR program, which was operated by that center. Again, in 1999/2000, while still chair of BOSC, I oversaw a review of the STAR program that BOSC and EPA's Science Advisory Board conducted jointly. Now as I mentioned earlier, I served on the NRC Committee to Review EPA's Research Grants Program. The findings and conclusions from this most recent report, along with those from the previous BOSC reports, lead me to conclude the following.

First, environmental regulatory decisions must be informed by the best science. The STAR program is judged to be the best mechanism that we have for providing the very best science through extramural sources. Second, research in STAR is focused on EPA's and the country's greatest environmental needs. And finally, the STAR program has an exceptional process for the peer-review of proposals. The NRC Committee stated in its conclusions that the STAR program "compares favorably with and in some cases exceeds that in place at other agencies that have extramural research programs, such as the National Science Foundation and the National Institute of Environmental Sciences Health," which is part of NIH.

The Committee, in its deliberations, developed its own metrics, and in that case, developed a series of nine questions, and for each question, there was a finding and a recommendation. Those are delineated in my written testimony, and also as a part of this report, which is called *The Measure of STAR: Review of the U.S. Environmental Protection Agency's Science to Achieve Results Research Grants Program.*

Mr. Chairman, that concludes my testimony. I would be pleased to answer any questions. Thank you and the Members of your Committee for the opportunity to participate in this hearing.

[The prepared statement of Dr. Denson follows:]

PREPARED STATEMENT OF COSTEL D. DENSON

Good morning, Mr. Chairman and Members of the Committee. My name is Costel Denson. I am a Professor of Chemical Engineering at the University of Delaware where I have been employed since 1977. I have also served there as Vice Provost for Research. In that position I had oversight of, and was responsible for, all aspects of the research enterprise at the university. Recently, I served as a member of the National Research Council (NRC) Committee to Review EPA's Research Grants Program. The NRC is the operating arm of the National Academies of Sciences and Engineering. I am pleased to be here to discuss the unanimous findings and recommendations of that committee.

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The findings and conclusions from this most recent report, along with those from the previous BOSC reports, lead me to conclude the following:

1. Environmental regulatory decisions must be informed by the best science: the STAR program is judged to be the best mechanism that we have for providing the very best science through extramural sources.

2. Research in STAR is focused on EPA's and the country's greatest environmental needs.
3. The STAR Program has an exceptional process for the peer-review of proposals. The NRC committee stated in its conclusions that the STAR program "compares favorably with and in some cases exceeds that in place at other agencies that have extramural research programs, such as NSF and NIEHS (NIH)."

In 2000, EPA asked the NRC to conduct an independent assessment of the STAR program. In response, the NRC established a committee and gave it the following tasks:

Assess the program's scientific merit, its demonstrated or potential impact on the agency's policies and decisions, and other program benefits that are relevant to EPA's mission;

Recommend ways to enhance the program's scientific merit, impact, and other benefits; and

In the context of other relevant research conducted or funded by EPA, and in comparison with other basic and applied research grants programs, address the STAR program's research priorities, research solicitations, peer-review process, ongoing research projects, and results and dissemination of completed research.

In 2003, the committee completed its report, *The Measure of STAR, Review of the U.S. Environmental Protection Agency's Science to Achieve Results (STAR) Research Grants Program.*

In its evaluation, the committee developed a series of nine specific questions that it considered were of greatest importance to the research program. I will present each of these questions, along with the committee's overall findings and recommendations for the STAR program.

1. Should the STAR program continue to be part of EPA's research program?

Finding. EPA requires a strong and balanced science and technology research program to fulfill its mission properly. The STAR program is an important part of the overall EPA research program.

The STAR program is EPA's pre-eminent program that solicits independent scientific and technologic research from the Nation's best academic and other nonprofit research institutions. The program has established and maintains a high degree of scientific excellence. Through broadly advertised, competitively awarded, peer-reviewed grants, the STAR program provides the agency access to independent information, analyses, and perspectives.

The STAR program provides the agency access to a broad community of researchers, allows it to fund research at the cutting edge of science, and assists it in addressing information gaps that it does not have the internal resources to address properly. The STAR program also encourages its grantees to disseminate their research results widely in peer-reviewed scientific journals.

Recommendation. The STAR program should continue to be an important part of EPA's research program.

2. What is the unique contribution of the STAR program?

Finding. The STAR program funds important research that is not conducted or funded by other agencies.

For instance, the STAR ecologic-indicators program is the primary source of support of research on the development of water-quality indicators for biologic monitoring. The interdisciplinary centers that STAR has funded also represent an innovative approach to supporting research that will be most relevant for environmental decision-making.

The STAR program has also made commendable efforts to leverage funds by establishing research partnerships with other agencies and organizations that have similar or complementary research interests, including the National Science Foundation, the Department of Energy, the Office of Naval Research, the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, the National Institute of Environmental Health Sciences, the Department of Interior, and the American Waterworks Research Foundation.

Recommendation. STAR should continue to partner with other government and non-government organizations to support research of mutual interest and of rel-

evance to EPA's mission, explore innovative approaches for carrying out this research, and sponsor a diverse portfolio of research that alerts the agency to emerging issues and provides independent analyses of issues that the agency is currently addressing.

3. Does the STAR program have adequate processes to ensure that it is sponsoring high-quality and relevant research?

Finding. The STAR program has developed a grant-award process that compares favorably with and in some ways exceeds that in place at other agencies that have extramural research programs, such as the National Science Foundation (NSF) and the National Institute of Environmental Health Sciences. An unusually high degree of planning goes into identifying the specific research subjects to be supported. The agency also puts considerable time and thought into preparing effective research solicitations and into funding projects that are relevant to its mission and program needs. Furthermore, the STAR program has established a rigorous peer-review process.

Recommendation. The STAR program should continue to improve the focus of its Request for Applications, and when the agency does not have the capacity internally to adequately define the state of the science in a particular research field, STAR should consider greater use of external experts to assist in identifying the highest-priority research and data gaps.

4. Is the STAR program producing high-quality research results?

Finding. Although it is still too early for comprehensive evaluations of the research results of the STAR program, some STAR research efforts have already substantially improved the scientific foundation for decision-making.

Many STAR projects have resulted in articles in highly respected, peer-reviewed journals a traditional measure of research quality. These STAR research results have already helped to improve our understanding of the causes, exposures, and effects of environmental pollution information critical to improving the scientific foundation for decision-making. For instance, STAR-funded research on particulate matter has helped to improve our understanding of the biologic mechanisms by which inhaled ambient particles cause health effects and the nature of some of these effects. These data are critical to future regulatory decisions regarding our nation's ambient air quality.

Recommendation. EPA should continue its efforts to attract "the best and the brightest" researchers to compete for STAR funding.

5. Are the STAR program results useful for EPA decisions and processes?

Finding. The STAR portfolio effectively supports EPA's mission and research and development strategic plans and GPRA goals. Specific STAR research projects have yielded significant new findings and knowledge critical for regulatory decision-making.

The STAR program is too young to be able to document fully the extent to which its research results are being used to inform development of new regulations and environmental-management decisions. However, some STAR projects have already yielded information important for environmental decision-making. For example, STAR-sponsored research in endocrine disruptors, particulate matter, and ecologic assessment has resulted in groups of peer-reviewed publications of immediate use in understanding causes, exposures, and effects of environmental pollution. Those results are directly relevant to EPA's mission to "protect human health and to safeguard the natural environment—air, water, and land—upon which life depends." For instance, research on ecologic indicators has led to the development of a dynamic, economically linked model to evaluate the driving forces and ecologic consequences of land-use change.

Recommendation. The STAR program and EPA's Office of Research and Development should develop mechanisms for documenting the extent to which its research is being used to support the agency's environmental decision-making, should consider using outside experts to help document systematically the "state of the science" before research is initiated, and should synthesize the results of the research when it is completed to identify the specific contributions that STAR and other EPA research has made to providing critical information.

6. Is the STAR program effective in providing results relevant to the appropriate audiences?

Finding. The STAR program has been commendably aggressive in experimenting with innovative approaches to communicating the results of its funded research to a wide variety of users and audiences, but its success in these efforts has been uneven.

The STAR program supports research of potential value to a variety of users and audiences, both in and outside EPA. Much of the research is aimed primarily at the scientific community and those responsible for providing technical support for environmental-management decisions.

The program, however, also has other potential users, at least for some of its research results, including other federal agencies; industry; State, tribal, and local governments; nonprofit environmental organizations; and international environmental agencies.

The STAR program has experimented aggressively with a wide variety of communication mechanisms, including EPA's web site and publication of reports. Through these efforts, the program appears to substantially exceed the dissemination efforts of most other research-sponsoring organizations, both in and outside the Federal Government. Nevertheless, the STAR program could substantially improve its dissemination efforts by directing them more effectively to specific users and audiences.

Recommendation. The STAR program should clearly identify the intended audiences for proposed research results as early in the process as possible and indicate them in the Request for Applications. When appropriate, EPA should consider involving representatives of the intended audiences from outside the agency to help define the relevant research results and a strategy for their dissemination.

7. Should the fellowship program continue to be part of EPA's research program?

Finding. The STAR fellowship program is a valuable mechanism for enabling a continuing supply of graduate students in environmental sciences and engineering to help build a stronger scientific foundation for the Nation's environmental research and management efforts.

It is the only federal fellowship program exclusively designed for students pursuing advanced degrees in environmental sciences.

Recommendation. Given the Nation's continuing need for highly qualified scientists and engineers in environmental research and management, the STAR fellowship program should be continued and funded.

8. Are the STAR program's funds adequate to achieve its objectives?

Finding. STAR is only able to fund less than 15 percent of the proposals received for its individual investigator and center grants, and its funding has not kept pace with the rate of inflation.

NIH and NSF strive to fund, on the average, 25–30 percent of the proposals received. STAR's budget allows it to fund only 10–15 percent of the proposals it receives and only about 60 percent of those rated "excellent" or "very good" by its independent quality peer-review panels. By that measure, STAR does not have sufficient funds to recognize all the best proposals received.

Although the STAR program's budget grew rapidly in its first three years, it has not kept pace with general inflation in the last few years. That is particularly true of the STAR fellowship program. The effect of that budgetary situation is exacerbated by the fact that costs of research have outpaced general inflation for more than a decade. Therefore, at present, STAR funds buy less research than the same amount of money could have bought several years ago.

It is appropriate to consider the funding of the STAR program in the context of the overall funding for all of EPA's Office of Research and Development, which also has not kept pace with inflation. STAR currently represents about 18% of EPA's Office of Research and Development total funding. The committee considers that percentage to be a reasonable recognition of the value of independent peer-reviewed research to the agency.

Recommendation. STAR program funding should be maintained at 15–20 percent of the overall research and development budget, even in budget-constrained times. However, budget planners should clearly recognize the constraints of not having inflation escalators to maintain the level of effort of the entire program.

9. How should the STAR program be evaluated?

Finding. There are no easy answers when it comes to identifying metrics for evaluating research programs, and the best approach for evaluating the STAR program is to establish a structured system of reviews by panels of experts.

The committee assessed the quality, relevance, and performance of the STAR program, as set forth in recent OMB research and development criteria, by using qualitative and quantitative metrics. That is one approach for reviewing the STAR program and similar programs. Several examples of qualitative and quantitative metrics that were used for evaluating the STAR program are: Does the STAR program have a clearly defined plan for regular, external reviews of its research quality, and has this plan been effectively carried out? Has the program made significant contributions to advancing the state of the science in particular research topics? Does the program award grants expeditiously? Does the program have a schedule for the products it intends to produce and how well is it adhering to the schedule?

The committee's judgment is that quantitative metrics, although outwardly simpler to use, are not necessarily more informative than qualitative metrics. In some cases, quantitative metrics can be misleading, and emphasizing inappropriate metrics can distort the research outputs of a program. Qualitative metrics are less likely to have such effects, but they need to be interpreted carefully.

The committee judges that expert review by a group of people with appropriate expertise is the best method of evaluating broad research programs, such as the STAR program. Expert review is appropriate for evaluating both the processes and the products of the STAR program. Both qualitative and quantitative metrics can provide valuable support for such expert reviews.

Recommendation. STAR and EPA's Office of Research and Development should establish a structured program of reviews by panels of independent experts and should collect the appropriate information to support these reviews.

Mr. Chairman, that concludes my testimony. I would be pleased to answer any questions. Thank you and the Members of your committee for the opportunity to participate in this hearing.

BIOGRAPHY FOR COSTEL D. DENSON

Costel Denson is a professor of chemical engineering at the University of Delaware. He received a B.S. from Lehigh University, a Master's from Rensselaer Polytechnic Institute and his Ph.D. from the University of Utah, all in chemical engineering. His research has focused on the rheology and processing of polymeric materials and he is a fellow of the Society of Plastics Engineers. Dr. Denson has served as Vice Provost for Research at the University of Delaware where he was responsible for the administration of all aspects of the research enterprise. He has served as chair of EPA's Board of Scientific Counselors and is a past chair of the Materials Task Force at the Military Engineering Center of Excellence. Dr. Denson has served as a member of the National Science Foundation Advisory Committee for Environmental Research and Education and on the National Research Council's Committee on Air Quality Management in the United States. He has also served on the Ford Foundation Minority Predoctoral Review Panel on Engineering.

DISCUSSION

Chairman EHLERS. Thank you very much, and thank you to all of the witnesses for being here and for your testimony.

We will now begin with the questions. The Chair will recognize himself first for five minutes, and then each Member, in turn, will receive a five-minute question period. If there are sufficient questions, we will continue with a second round, as well.

RATIONALE FOR SCIENCE TO ACHIEVE RESULTS (STAR) RESEARCH GRANTS PROGRAM BUDGET CUTS

The first question is for Mr. Johnson and Dr. Gilman. You have—been interesting in my career in the Congress. Because I am a scientist, Members are constantly coming to me to ask my opin-

ion on scientific issues and questions, and probably the most often repeated phrase that I have heard is I want some good science on this. Frequently, they will also say I want sound science, in which case I say I don't know anything about acoustics. But I do know something about good science, and I have been actively involved in trying to improve the scientific effort of the Nation in every agency, including the EPA, and I am very pleased the EPA has made considerable progress.

It is very disappointing to see the recommendations for the big cuts that we are seeing recommended here. The 92 percent I referred to earlier and the 35 percent in STAR, and the question for Mr. Johnson and Dr. Gilman is why the cuts? Where does this come from? This is not just a reallocation. This is really a cut, unless you can show me that you are transferring money to some other agency to do the same type of research. Particularly in the environment, Members of Congress are very interested in good science. They want it done right. They want to know the right answer so they can make the right decision, so I would appreciate comments from both of you on this issue.

Mr. JOHNSON. The more substantive answer will come from Dr. Gilman, I suspect, but let me just give you my general view of this.

As we mentioned, we think the focus should be on what we are getting, what the result is, what we are learning and what—how we are advancing our usual pursuit of a cleaner, healthier environment. The feeling was that the 20-some odd million dollars would be better spent in other programs than in the Ecological Research and Pollution Prevention Programs because we believe that there are more specific deliverables that could be resulting from those programs. We think those programs are well-funded now, and we believe that there would be little detriment to the output of those research programs with those cuts. We believe we could produce a greater return for the 20-some odd million dollars if we put those monies in the Prevention of Pesticides and Toxics Program.

I think this President has demonstrated his commitment to all the things that EPA stands for and all of these environmental objectives that we all share. This is—should not be considered to be a back-off in the President's or the Administration's commitment to a healthy, clean environment. It should be considered to be a focus on what we should be—what we are trying to get for our money, not how much money we are trying to spend. Now for the real answer, Dr. Gilman.

Dr. GILMAN. Well, there is no question there is competition for resources. The Agency is putting forward a number of aggressive efforts proposing a $150 million increase in Superfund, proposing a School Bus Diesel Retro-Fit Program on the order of $60, $65 million. There is also an initiative in leaking underground storage tanks. You know, the list goes on. These are the kinds of things that create a competition for funds within the Agency. So in terms of where do we place the dollars, that is certainly an element for consideration. For the ecological research, the program still has a substantial effort beyond the cuts, as is the case in pollution prevention. So we think we can still drive those programs to have good work done and good outcomes from that work, even with these reductions.

Chairman EHLERS. But I am really puzzled because science is the basis for what you do, and it seems to me you are transferring money out of scientific research and into programs, and I just can't believe that the science has been done. That you don't have to do it anymore, and that it should be cut by that. I am particularly concerned about the STAR program, which has received high ratings. You heard two panelists here today make good comments about it, good reviews, and it is generally acknowledged as being one of the strongest environmental programs. Why cut STAR by 35 percent? And I know there is always a tendency of managers to say well, we have got to protect our own employees, and therefore, we will cut the outside. But you get more for your money with STAR than I think you get almost anywhere else.

What is the justification for cutting STAR?

Dr. GILMAN. Again, the decision wasn't made on the basis that STAR is a bad program. Decisions were made on the basis of the program reviews and the elements of the ecological and pollution prevention programs.

Chairman EHLERS. What are these program reviews you are referring to?

Dr. GILMAN. The program reviews that we did in collaboration with the Office of Management and Budget's PART exercise.

Chairman EHLERS. So you are saying the cuts are a result of applying PART?

Dr. GILMAN. Yes, for these two programs, that is the case, but not as it relates to performance of the STAR grant program per se. The reductions were made in the STAR grant programs because, just as those programs are the place where we can easily ramp up, it is also the place where, in terms of managing the entire research enterprise for the agency, we look to ramp down when we have to make a reduction. It is the place where we do the least disruption to our infrastructure for research when we have to make those reductions.

Chairman EHLERS. But that implies that you are doing it because it is easier to ramp down, even though some of the best science is done there.

Dr. GILMAN. Well, I wouldn't say it necessarily is better than, though it sometimes is different than, the work that is going on inside the Agency. But the alternative of cutting back on the resources for the Intramural Program or reducing the Intramural Program is for the longer run. When we are very hopeful of re-engineering these programs and getting them their better measures and their better performance—to begin to reduce the internal infrastructure when we hope to be able to turn these things around doesn't make sense in our opinion.

Chairman EHLERS. Well, it doesn't make sense to me when the President is trying to freeze the discretionary non-defense, non-security budget that we are cutting a major effort on your part. I mean, all of EPA is being cut, and that also doesn't make sense to me. If we are freezing, let us freeze everything where it is, but let us not cut to this extent.

My time has expired. Let me just add one point, and after spending a fair amount of my life in science and part of it in managing science, I can assure you that managing science is one of the most

difficult enterprises around because it is very difficult to develop measures for measuring science because you really literally do not know what the outcome is going to be. And it takes a special type of expertise and I am very, very suspicious of instruments and methodologies that are applied across the board by any agency, whether OMB or something else, that just says okay, fill in the blanks and then we will make a decision. That does not do justice to the enterprise, and I think we have to be very cautious about that.

Mr. Johnson, did you want to respond before I go on?

Mr. JOHNSON. Yes, I would. I think we recognize that R&D needs to be looked at differently than an operating program, and so the questions are different. I have gotten to know Eli Zerhouni in the last year plus, and he talks about the opportunity to better manage our investments in research better than we are now, and he understands way better than I and comparable to your understanding as to how difficult it is to measure this, but these can be managed. Shame on us if we don't continually try to deal with all of its difficulty, try to get a better understanding of what we are getting and are we on track, and is there accountability? And we understand that the end product, especially of basic research, is by definition an open question. But like every dollar we spend, we must continue to try to find better ways to make sure that the money is well spent.

Chairman EHLERS. I don't agree with your goal. I disagree with the result you have come up with. I have—my time has expired. I would like to—who came first? All right. Zoe, you were first. Please recognize Congresswoman Lofgren from California.

INCORPORATION OF STAR SCIENTIFIC RESEARCH INTO DECISION-MAKING

Ms. LOFGREN. Thank you, Mr. Chairman. I thank you for holding this hearing today. I think it is an important one, and although the testimony has been a little bit dense, I think we can really distill what is going on here so that it is easily understood.

I remember years ago a Member of the House giving me a phrase about OMB. That they know the cost of everything and the value of nothing, and I think we have got that kind of fight brewing here—I don't mean disrespect, but it is a word we use often in the House, the bean-counters versus the scientists, and when it comes down to good science, I am going to rely more on the scientists than I am on the CPAs. And it does disturb me that the basic research that we are—have gotten through the STAR program, which has been evaluated by the scientists, and Dr. Denson, I found your testimony, written testimony particularly helpful because as you went through the analysis that has been undertaken of the program, it is not without rigor, and it—but it is not mechanistic. It has been an analysis that actually is thoughtful. It is not, you know, check off the boxes, and I think that is the kind of analysis that we need to have.

And that doesn't mean that changes won't sometimes result because I know—I am not a scientist, as the Chairman is, but I have certainly—I come from Silicone Valley. I live surrounded by scientists, and there is not a more vicious critic of science than an-

other scientist. So that can certainly result. But I am just sort of wondering, when you look at these nine specific results, on page eight of your testimony, really the—one of the things that you discovered was not that the science that was being developed was flawed or defective, but there were big questions about the extent to which the research was actually being used, I am quoting you, "to support the agency's environmental decision-making." So the question, as I understood it, was really not about the science delivered through the STAR program, but the agency's inability or questioning their ability to actually incorporate the data in their decision-making.

Is that a fair analysis of that testimony? I don't want to misquote you, but that is the way it seemed to me.

Dr. DENSON.I think that is an accurate assessment. I would add one other thing, and that is that it takes a while for the research results to percolate through the system and to apply the results to some known situation. These results, the research results in many ways are autocatalytic in that they feed on each other, and so once you have a set of results, a scientist someplace reads those results and has another idea that yet takes it to another level. And finally, it gets to a critical mass where it becomes very obvious how these results can be used to implement a particular program.

My own sense, and this is my personal reflection since I have been involved with it since nearly the start, is that the STAR and the agency have made great strides in improving the program and improving the way it implements the results. They have a way to go yet. I think the STAR program has some improvements to make, and we have mentioned what those are. But in every step along the way that I have been involved in the evaluation of STAR, when those comments have been made, the agency has responded very promptly and forthrightly in trying to make the changes and the improvements.

EFFECT OF ECOLOGICAL RESEARCH PROGRAMS BUDGET CUTS ON HUMAN HEALTH RESEARCH PROGRAMS

Ms. LOFGREN. Well, listening to your testimony and really the testimony of all the witnesses, it seems that the extramural portions of EPA's research efforts, including the research on ecological systems, I am particularly interested in the mercury analysis, are basically just not going to happen if the STAR program sustains the kind of cuts that are recommended. You are a prominent scientist, and I thank you very much for volunteering to do this for so many years. Is that your assessment as well?

Dr. DENSON. I believe that—I believe personally that it would be detrimental to cut the ecological programs for several reasons. One is that you have to recognize that EPA and ORD is a regulatory agency, and conducting research in a regulatory agency is different than conducting research in other kinds of agencies. One feeds on the other. It is a coupling effect. What happens in research on human health informs what happens in research and the results on the ecology, and vice-versa. So they are intimately coupled. And if you cut one, then in an agency of this sort, I think you seriously undercut the ability to do research across the board.

My second point is this, is that the National Science Foundation conducts, in the environmental area, research on ecological problems. I mean, they don't do human health research.

Ms. LOFGREN. Right.

Dr. DENSON. The National Institute of Health does human health research. So we have two compartments. And what EPA, ORD is doing is to bring those two together because they are in a regulatory agency and they have to conduct research, one arm which informs the other. So to cut the ecological part, impairs EPA's and ORD's ability to carry out its mission. See, because that is part of their mission, and they need that, as we said in this report, they need a strong research arm.

Ms. LOFGREN. I know my time is over, Mr. Chairman, but I would just note that at a time when there has been a wide concern about proposals to increase the amount of mercury that can be permitted in the environment, I think the American people are going to be very suspicious of a proposal to cut research into the mercury element, while, you know, polluters are being promised relief for more mercury in the environment. I think it is a terrible message to give to the American people who I don't think ever asked for more pollution in their children.

Chairman EHLERS. The gentlewoman's time has expired. Pleased to recognize the gentleman from Texas, Mr. Burgess.

IMMEDIATE EFFECTS OF SCIENCE TO ACHIEVE RESULTS (STAR) GRANTS PROGRAM BUDGET CUTS ON EPA RESEARCH

Mr. BURGESS. Thank you, Mr. Chairman, and I also thank you for calling this hearing today.

Let me first ask Dr. Gilman if the Science to Achieve Results, if the cuts in that program are implemented as written, what do we lose? What research are we going to—what is going to be the immediate effect of that?

Dr. GILMAN. There are a set of requests for proposals that we would have otherwise put out on the street that we will not put out on the street, but none of the cuts that we are proposing to the Extramural Program would, in and of themselves, terminate research overall. So there is still a substantial ecological research effort underway. It behooves us to do more towards collaborating with some of our other federal agencies to stretch the dollars we have there. In the case of pollution prevention, we have a substantial Pollution Prevention Program remaining. We are in the process of re-engineering that program, and there is a true connection between the results of the PART process and our efforts to re-engineer that process and change its focus. So none of the cuts to the program will terminate initiatives in either ecological research or in the pollution prevention research.

Mr. BURGESS. Well, then taking the last point from the gentlelady from California, will the mercury research and the research on human endocrine disruptors, will that continue?

Dr. GILMAN. That research does continue. The mercury research is a good example. Actually, we received a cut from the Congress in our proposed budget for 2004, which made us cut back on an initiative we had proposed in mercury-related research. In effect, the

proposal for 2005 would take that off the table, as the Congress did as well, but we still have an intramural program. The big focus of our intramural program at this point is trying to better understand how we can do continuous monitoring of emissions for mercury so that we can put in place the regulatory program that has been proposed. The regulatory program that has been proposed for mercury reduction does constitute the largest reduction that has ever been proposed, and it is the first time that power companies will be required to reduce their mercury emissions.

Mr. BURGESS. Okay. Let me be clear on that then, that program is going to continue to go forward. Is that correct?

Dr. GILMAN. Yes.

Mr. BURGESS. All right. Then just to give us a flavor of what is on the shelf in those requests for proposals, what are some of the things that will not be brought forth as a result of the reduction in funds?

Dr. GILMAN. In substance, there is no one particular body of research that won't go forward. It is the supplemental work that would be done by extramural researchers. There is no question that that supplemental research would be of value to us, but it is not anything that we can't make up for in the future, in my opinion.

Mr. BURGESS. Very well. Dr. Denson, and too, I thank you for providing such a comprehensive but readable paper for us. You allude in here to that you do research that is not funded by other agencies, but there is also some discussion about leveraging your funding and partnering either with I guess other agencies or with private, nongovernmental organizations. Can you talk to us about that just a little bit? If the proposed cuts go through, how are you prepared to carry forward to make sure to maximize your research dollars and to leverage those dollars so that they are spent effectively?

Dr. DENSON. I would speak to that question, sir, as a Member of the NRC Committee. If I understand the question correctly, my response would be this. That one of the areas where we gave STAR program very high marks was in the area of partnerships and collaboration. The partnerships allowed STAR program to greatly leverage the funds that they have, and in particular, in terms of the ecology, I am thinking of leveraging the funds to the National Science Foundation and the Program for Technology for Sustainable Environment. So areas where there are not a great deal of resources in the STAR program, they have been very diligent with the money they do have in leveraging it with other organizations. As I said, NSF is a good example because they only work on ecological problems, on environmental problems.

And the STAR program has been diligent enough to take what resources they have to leverage those with NSF. If those monies are cut, then one would have to look at the leveraging effect because not only do you lose the money that is cut, you lose what you could have gotten in that leveraging effect.

Mr. BURGESS. Very well. I see my time has expired. I take your point that we will lose the multiplier effect. I want to thank the panel for doing this today, being so well-prepared. It has been very informative to me, and I will yield back.

APPLICATION OF THE PROGRAM ASSESSMENT RATING TOOL (PART) AND ALTERNATIVE REVIEW METHODS WITHIN EPA'S OFFICE OF RESEARCH AND DEVELOPMENT

Chairman EHLERS. The gentleman's time has expired. Mr. Davis has stepped out of the room temporarily, so I will proceed with my next questions and we will recognize him, should he return.

I just wanted to note, Dr. Matanoski, you in your testimony said that PART appears to favor short-term R&D programs with near-term benefits at the expense of programs of long-term benefits. I also noticed Mr. Posner has also had some criticisms of PART, and the real question is what is a good evaluation program? Mr. Gilman, you said that EPA is committed to developing good standards by which to measure EPA's R&D programs. A question, Mr. Johnson, is what standards would OMB find acceptable? It seems to be the thinking of the scientists here and GAO that PART is not applicable as it has been used to the scientific programs. I am wondering, and I am sympathetic to good management of science. I always have been.

The question is can we do it right? I remember we worked very hard in this Committee when GPRA came out to modify GPRA as it is applied to science so that it made sense, and after some stumbles, I think that has begun to work. The question is, Mr. Johnson, what standards would OMB find acceptable if we are going to improve this? How can we make PART fit science, rather than the present situation where we have at least expressed opinions here that PART doesn't really fit in this situation? The Floor is yours.

Mr. JOHNSON. I can't speak, maybe Dr. Gilman can, on what specific opportunities we have to improve the R&D criteria that are addressed in the PART R&D, R&D PART. But I do know Dr. Zerhouni is supportive of use of the PART in assessing various research programs, and the PART will get better and better each time. There is nothing magic about the PART, these 25 questions. We think these are good questions now, and they will get better every year as we get smarter and smarter, and the goal here is to look at, on a regular basis, everything we spend money on, including science, and ask ourselves is this consistent with our priorities? Do we think we are getting something for our money? Is the research money of these long-term projects being well-managed, and if not, what can we do about it?

But I don't know the answer to your specific question.

Chairman EHLERS. Okay. I will make a comment, but let me let the others comment first, and we will go through the whole panel. Dr. Gillman?

Dr. GILMAN. Okay. Mr. Chairman, EPA is not GPRA-phobic. We are not afraid to be measured. We, the science arm have tried hard. We need to do better. One of the things we have done is a pilot with the Office of the Inspector General, trying to develop a way of planning our program and measuring our program that really does look to long-term outcomes. That is a pilot effort that we have brought before the Office of Management and Budget and hope to continue the discussions whether we can look at the program slightly differently? To try and sum it up for you, when you are developing research in science in a mission-oriented Agency

like our own, it is difficult to look at the results of that work in the absence of asking yourself how well has the program integrated the results that were to achieve the long-term outcomes?

So what we are, in short, proposing is an integrated process, looking at both the program and the research arm to ask the question how is the Agency doing in getting the outcomes it wants with the research it is engaged in?

Chairman EHLERS. As you know, we have had a number of discussions about integration and I am very interested in strengthening that effort within the EPA by increasing the scientific component of it. Mr. Posner.

Mr. POSNER. Thank you, Mr. Chairman.

I want to make sure we are not saying that PART shouldn't be applied to science programs. I think recognizing that there are particularly unique challenges, given the long-term nature of how results unfold and the uncertainties with science programs, means you have to be careful, and OMB does have particular questions for R&D. That may be one area that needs to be focused on. I want to add, thanks to the National Academy of Sciences, the National Science Foundation and others, there are developed criteria for doing this.

One of the things that we typically find when we look at research, such highway research, is it the success story model, which is really not the way necessarily to go, where agencies reach for individual good examples to justify their programs. But what we want to see and what has been developed in the National Science Foundation and others is a way for scientists to get peer-reviewed retrospective evaluations of portfolios of research. This is something that has been developed in other agencies and it is the kind of thing that I think OMB has endorsed in their research criteria. The National Academies of Science really laid this out as a model.

So when we are talking about having leading scientists review the results of science programs, that is the model of accountability that makes sense here.

Chairman EHLERS. Well, thank you, and what we are specifically interested in is what specific measure should OMB use to evaluate EPA's R&D programs, or for that matter, other R&D programs? So we will continue with Dr. Matanoski.

Dr. MATANOSKI. I think our committee, the Science Advisory Board, in looking at the actual outcomes, suggested that the short-term outcome would fare much better in the PART review than would any long-term outcome. Now if you add on top of the long-term outcome something like ecological research, which is so complex, it has so many ramifications to it that when you go back and start looking at one basic piece of it and then carry it all the way to its completion at the end, which we don't even do to be truthful—we don't even know what is the best ecological end for most of what we are looking at, take that and try to produce an outcome with it becomes extremely difficult.

It is easy to say I have to model something and I go in and I model that, like whether jellyfish are doing well in the Chesapeake Bay, and if you can do that, you can do that very well and you can do certain pieces of research and figure it out. But when you try to put the whole thing together, the entire fish population, the en-

tire growth population, the entire water systems of all of these, it becomes a very complex not only research arm, but a very complex outcome arm. And so the long-term outcome is you want something better in your coastal waters, for example. But all the pieces that have to go into the research to get there and then the application become too complicated to measure simply with a tool.

I agree wholeheartedly that everybody has to be accountable for their money, in science as well as anywhere else. It is just the same as if we were in a business. But by the same token, when you get a complex program like that, it is very difficult, and our recommendation was that they begin to think about instead looking at a committee that looked at the tool along with an actual science review group, and then gradually, you could work aware, as you began to figure out what was the best way to do this. You could begin to work your way back and evaluate each piece. Right now, it is such a complex issue; it would be very difficult to do that.

Chairman EHLERS. Dr. Denson.

Dr. DENSON. Yes, sir. I am going to answer the question in two ways, from two perspectives. One is that from the perspective of the Committee, the NRC Committee. That Committee attempted to do guidelines at that time, those guidelines required the Committee to look at metrics of performance, quality and relevance of the program. And the Committee judged the programs on those bases. The metrics they used were both product and process metrics. The Committee discarded bibliometric types of analysis, quantitative types of analysis in evaluating the program, and instead concluded that complex research programs, and I use the word programs very carefully, require a different kind of evaluation. And that evaluation means bringing in a panel of experts to peer-review the program in all of its aspects. To bring in a panel, peer-review all of the aspects of the program.

And as we point out in the report, we call this a level three or a level four evaluation. Level one evaluations, which look at individual grants, the progress of an individual research project can be graded quantitatively, and you can use bibliometric analysis for that. But the Committee concluded that that was inappropriate for a program as complex as the STAR program, which we consider to be a level three program. The ORD program in general would be a level four program, and you would need a much bigger, much broader panel of experts to review that.

I am going to change for just a moment, sir, and bring out the fact that for four years, I served on the National Science Foundation's Advisory Committee for the Engineering Directorate. I also served for two years on the National Science Foundation's Directorate Advisory Committee for Environmental Research and Education. So I have a perspective of how it is done in one of the very best research agencies. And there, while they follow the GPRA and have the tools, ideas and people concern, there it is also difficult to do a metric on some of the programs until they have had a chance to fully develop. And my point about the STAR program is that it just needs a little bit more time, and I think that given that time and more results and having a review of a complex program by a peer-review panel would be the metric to use, and we say that in our report.

Chairman EHLERS. My time has expired. We will recognize the gentlelady from California, Ms. Lofgren.

TERMINATION OF EPA'S BUILDING DECONTAMINATION RESEARCH PROGRAM

Ms. LOFGREN. I wanted to explore a specific program and—because I serve on the Homeland Security Committee as well, and I am on the Cybersecurity and Science Subcommittee, and we are obviously spending a lot of time in that area. And I was interested in the termination of the Building Decontamination Research Implementation Plan, and I was wondering, Dr. Gilman, it is my understanding that last year, the National Academy of Sciences, at EPA's request, reviewed that plan. They indicated, the National Academy did, that it was not possible really for EPA to get the job done in the timeframe remaining. I am interested in why EPA wants to terminate the program, rather than extending it and is that your judgment that building decontamination is now a lesser threat, or is that because this decision was made in conjunction with the Department of Homeland Security, Mr. Ridge, and is it going to be transferred to Homeland Security? Because we haven't seen it surface yet in that department.

Could you give me some report on——

Dr. GILMAN. Sure.

Ms. LOFGREN.—that?

Dr. GILMAN. Let me start by giving you a little background of the research effort at EPA, which we are very proud of. We set out to establish a center there. It is something of a virtual center. We gave it a time, a sunset in creating the center, a three-year window to do the work. Why did we do that? We did that because we wanted to really drive the folks involved in delivering products to first responders and to planners. So we created the center. Its mission was to work heavily through partnerships with Homeland Security, the Army, Air Force, Food and Drug Administration, all of the different groups where we might find technologies and approaches to utilize in the mission areas for the EPA—they include water infrastructure, both drinking and sanitary. They include buildings, and it includes the use of tools for rapidly assessing risks for different factors.

Those are the three areas the research center is focused on. We are in the process right now of working with those various agencies who view themselves as our customers to determine what we should do about that three-year sunset, whether there should be a further research effort within a center embedded elsewhere in the Agency. The decontamination program, that again was meant to be a three-year program. That is what the National Research Council reviewed for us. We are in the process now of trying to identify those things that were in the third year of our program that we would like to move up into the second year. We haven't expended all the resources that have been appropriated for the first two years yet, so we do have the flexibility to change our priorities, and as I said, we are in consultation with Department of Homeland Security and others now about what their desires are for our future work.

I think the products that we have turned out so far are quite important and we are very, very proud of the productivity of that group to this point in time.

Ms. LOFGREN. It looks to me that the sun set on the thing. It is not really a work in progress, and it may be that we want to transfer the whole thing over to Homeland, but it is just I don't think that has happened, and with so many things in the Homeland Security area, not just environmental issues but where you have an activity going on by another agency and it never really gets picked up and it leaves the United States exposed and bare, I mean, in many respects, not just in the environmental arena, I am concerned that this is another one of them.

My time is just about up, Mr. Chairman. I would just say that I think this has been a very useful hearing. One thing I think has become very clear in the questioning is that the mechanistic application of PART two science is not going to serve the country well, and I really appreciate your leadership, not only as Chairman, but as a scientist in helping this committee, and then later, I think the Congress to understand that that will not well serve our country and our future. So I yield back the time, and thank you once again.

PEER REVIEW AND EVALUATION OF R&D PROGRAMS

Chairman EHLERS. The gentlelady yields back her time. Let us continue with some of the previous discussion. There seems to be a general agreement among three of the panel that peer-review is the best way to review R&D programs. I just want to establish, Mr. Johnson, Dr. Gilman, do you agree that peer-review is the best method to review the science programs, the R&D programs?

Mr. JOHNSON. Well, I will let, again, Dr. Gilman answer in a more detailed fashion, but I believe the PART has a very substantial role in the assessment of R&D programs. There is nothing mechanistic, not one thing that is mechanistic about the use of PART. Nothing happens automatically as a result of a PART score. I would like to just add one other comment—to elaborate on something Dr. Gilman said about the building contamination research. The balance—the *majority* of the funds appropriated for this research in the last two years are un-obligated. They have not been spent or committed. There is already plenty of money available for this effort. Additional monies are not needed in the fiscal year 2005 to continue this effort in an aggressive fashion.

Chairman EHLERS. All right. Thank you. Dr. Gilman.

Dr. GILMAN. The pilot that we worked with the Inspector General and the work that we would hope to do for the future does involve the use of peer-reviewers in evaluating both the research outputs and the long-term outcomes. The PART process envisions the use of that kind of peer-review. The National Science Foundation has availed itself of that. Those are the kinds of things we hope to be discussing with the Office of Management and Budget for the future.

Chairman EHLERS. Let me just comment. There are really two aspects, and I have seen these get interwoven here, but not clearly distinguished. It seems to me part of it is simply evaluating the science per se. Is the EPA doing good science? Is it judged by peers, it is really good work and should it be done? That is one aspect.

The other aspect is, in a sense, a management aspect. Does the research fit with the mission and the program of the EPA? And I think it is important to clearly distinguish those. Both of those are difficult to do, but they are of a different nature, and what is most difficult is to mesh the two. But isn't that what you are trying to do, Dr. Gilman, with your work and Mr. Johnson, your primary interest, I believe, is does the science fit the program? Does this make sense for the government to do? Is that a fair statement?

Mr. JOHNSON. Well, I would say more than that. Does it make sense for what our priorities are, is it promising fruit? Is it on track? Is the money being well-spent?

Chairman EHLERS. Right.

Mr. JOHNSON. Is it being spent in a responsible fashion? But I would also say that with regard to this—we are talking about generalities, and we also need to talk about specifically this program, the Ecologic Research Program. I am not a scientist, but as I understand it, Ecologic Research, the primary opportunity in this area of inquiry has to do with the *opportunity for us as a country is better monitoring and better diagnosing.* It is a pretty specific area. Therefore, the primary benefit or the opportunities to be pursued with research is to develop tools and databases to help informed decision-making.

There is, for this kind of research, a much more specific kind of end product, if you will, which is something you don't—it is not the right term for research, but it can—it is more purposeful than most research programs, and therefore, I think it lends itself more to PART assessment than basic research.

Chairman EHLERS. Absolutely, and I don't argue that. However, that is fairly low-level science, which makes it easy to analyze. I mean, monitoring and diagnosing is—well, I don't want to get into Pasteur's Quadrant here. Some of the scientists will know what this is. But that is in the lowest quadrant. The difficult part comes in, as one of the scientists mentioned here, synthesizing the information after you have monitored it, after you have diagnosed it, and then synthesizing it with other results from elsewhere.

So you are looking at organism X and organism Y and organism Z and many others and seeing how they are interacting and what the net effect is, and you find some very surprising things there, which you don't anticipate, some of which create greater environmental problems, some of which actually solve your problems. For example, depending—developing microbes that will consume toxic materials or oil. That is very basic research, but yet it is also related to the program. If you are trying to clean up underground storage tanks, as we have been trying to do for over a decade, that is a very important issue, if you can clean those up with microbial action rather than digging it up, hauling it somewhere, treating it at a very high cost.

So it all interrelates, and that is where my concern is. How are we evaluating how everything interrelates? And just without really knowing as much as I should about the evaluation program, it seems to me the PART program is ideal for what you just described, Mr. Johnson. But I don't think it is—from what I have seen, it is not the appropriate instrument for the broader picture, and the question is can we all, working together, develop some-

thing that is more appropriate for the broader picture? We are not here to condemn EPA or OMB. We are all part of the same team. We are trying to help develop something that really does the job and does it in the best way for the country, and I hope everyone, both panelists and audience, understand this. Our goal is, as I often tell my people back home when I give a speech, I am here from the Federal Government, and I am here to help you——

Mr. JOHNSON. Yeah.

Chairman EHLERS.—which usually brings a laugh. But that—I am serious about that. We really want to try to find out what the problems are and what we can do to help. Mr. Johnson.

Mr. JOHNSON. But as Dr. Poser said, or Mr. Poser said, one thing I believe with all kinds of programs, including research and development, basic and applied, the PART is causing us to ask really good questions, and that is more important than the kind of answers that we are getting, but it is causing us questions that we weren't asking before.

Chairman EHLERS. And Mr. Johnson, I have no objection to that. I think that is an important function. The question is how those answers are evaluated and how they are used, and what the appropriate use is. Did you have additional questions, Ms. Lofgren.

EVALUATING SHORT-TERM VS. LONG-TERM RESEARCH

Ms. LOFGREN. I think I do, but I think we are going to be having a vote soon, and the only thing I would note is Dr. Matanoski, in your testimony, you describe research that is targeted to fill a research gap in the short run versus other types of research intended to provide an understanding of large systems in the long run, and I am just wondering if it is possible to have programs that have only short-term or long-term goals, and not both. And as I look at the PART questions themselves, it appears that really, you are going to get penalized, and you can't get an approval if you have done that, and if your understanding is similar to mine.

Dr. MATANOSKI. I think it is very similar to what you have said. You have hit it right on the nose. If you have something that is very simple that I am going to evaluate, an operative procedure or something, and I know what the long—what the outcome is going to be and they are going to come off the table alive or dead, that is my outcome. That is easy. And I can tell you how many operations I do and how many are going to take place, you know, and who is going to do them.

When you get into a program as complicated and integrated as ecological research, then you really begin to have to look at the independent parts, part of which was STAR. And so STAR was at the very basic end of it, and some of the more applied and the monitoring, which is fairly easy, you know. You put how many monitors out there. How much do they show us, and whether they have improved the quality of the water. But when you begin to look at the whole picture that is a very difficult thing to do. So what do we need to do? Separate it out so I have a product that I can say comes out next week, and if I get it out next week, great. I have just met my goal. And, you know, that is—if you get that simple, like putting a car on the line and coming out at the other end, then you can easily use a——

Ms. LOFGREN. Right.

Dr. MATANOSKI.—very simple metric system. The more complicated you get, the more complicated any metric system would become, and right now, we are probably stuck with not having a very good metric system for a complicated problem.

Ms. LOFGREN. Right. In just looking at the questions, it is really biased against basic, complex research, it seems to me. I remember, Mr. Chairman, when I was first elected to the House and the late Congressman Steve Schiff was on the Science Committee and I was new to the Committee, and he actually gave an education to me and other new members about the value of basic research, and really its role in not just solving problems that are immediately before us, but really in building the economy of the country. And I think we would be ill-advised to forget Steve's lessons to us, and I yield back the balance of my time.

CONCLUDING REMARKS

Chairman EHLERS. I thank the Congresswoman for her comments, and I think we have kept you here long enough and tortured you enough, but I certainly want to thank the panelists for being here. You have been very, very helpful to me in helping me learn more about it from both sides of the issue, and I appreciate you being here. I would like to just summarize a few thoughts I have. So far, I have not heard any convincing reason why the STAR program should be cut so drastically, by all accounts. Not just what we have heard here, but other accounts I have heard. It is a well-run, competitive peer-reviewed program that produces high-quality research, and I don't think the proposed reduction should take place, and so we will work with the appropriators on that and see what we can achieve.

I also learned this morning the PART program was at least partially responsible for the funds being cut from Ecological and Pollution Prevention Research Programs, but it doesn't appear to me that PART is related at all directly to the cuts in the STAR program, and again, I don't quite understand why the cut, but we will have further discussions. And finally, I believe that PART has been a valuable tool for OMB in a number of different areas, and I am just not yet convinced that it is the appropriate one as it is structured to use for EPA and particularly I would be interested in how conclusions are drawn from the PART review and how they are used. It seems to me that the results of the PART program were not applied uniformly across the agency. That certain areas were cut more than they should have been, others were cut less than they should have been, if you look strictly at the PART review. And that is something else that we would like to investigate. Thank you again for being here. If there is no objection, the record will remain open for additional statements from the Members, and for answers to any follow-up questions the Subcommittee may ask of the panelists, and I hope you will be willing to answer in writing if any Subcommittee Members wish to send you communications. Without objection, so ordered.

Hearing is now adjourned.

[Whereupon, at 11:30 a.m., the Subcommittee was adjourned.]

Appendix:

Answers to Post-Hearing Questions

ANSWERS TO POST-HEARING QUESTIONS

Responses by Clay Johnson, III, Deputy Director of Management, Office of Management and Budget

Questions submitted by Democratic Members

Q1. GAO's review of the PART program indicated that PART and Government Performance and Results Act are not well integrated. GAO recommends these programs be integrated to be more complementary. Does OMB intend to adopt this recommendation? Will OMB alter PART to conform to GPRA or will agencies be instructed to alter their GPRA performance plans to conform to PART? Since GPRA mandated an open process for the development of agency strategic plans and performance measures, what process will OMB use to include Congress and program stakeholders in the effort to conform PART and GPRA performance plans?

A1. Responding in part to GAO's recommendation that PART and GPRA be better integrated, OMB clarified its PART guidance so agencies understood that PART is simply a tool to ensure GPRA is implemented as intended. The guidance now includes the following:

RELATIONSHIP OF THE PART TO THE GOVERNMENT PERFORMANCE AND RESULTS ACT (GPRA)

The GPRA statute provides a framework under which agencies prepare strategic plans, performance plans, and performance reports that set goals and report on the extent to which they are achieved. The PART is a systematic method of assessing the performance of program activities, focusing on their contribution to an agency's achievement of its strategic and program performance goals.

The PART strengthens and reinforces performance measurement under GPRA by encouraging careful development of performance measures according to the outcome-oriented standards of the law and by requiring that agency goals be appropriately ambitious. Therefore, performance measures included in GPRA plans and reports and those developed or revised through the PART process must be consistent.

The PART also extends the usefulness of performance information by defining programs that comprise activities about which management and budget decisions are made. As a matter of sound manage practice, agencies will integrate operational decisions with strategic and performance planning by:

- *improving performance measures over time through the PART review,*
- *aligning budgets with programs, and*
- *aligning programs and measures with GPRA goals.*

If agency goals are revised as a result of the PART process, agencies must engage in whatever consultation with stakeholders, including Congress, is required by GPRA.

Q2. In cases where OMB and the Agency disagree about the performance measure used to evaluate a program with PART, how is the disagreement resolved? Please provide documentation of the EPA and OMB positions on the PART evaluation of the Ecosystem Research Program. Please include documentation of the negotiations that led to the final resolution of the differing positions and the awarding of the final PART evaluation score for this program.

A2. OMB and agencies complete PART assessments together. We work hard to come to agreement on every answer to PART questions. Agencies can "appeal" OMB answers to PART questions to OMB policy officials, but this process is rarely used. The give and take between OMB and agencies in PART assessments is considered pre-decisional and therefore cannot be disclosed. However, OMB and EPA would be happy to discuss with you and/or your staff the process EPA and OMB went through to complete its PART assessments and, more importantly, what we are doing subsequently to improve the programs we assessed.

Q3. Under GPRA, program goals and performance matrices for programs are supposed to be adopted in consultation with Congress and outside stakeholders. However, it appears that PART-defined program goals and performance metrics are superseding those established under GPRA. Please provide a side-by-side comparison of the PART goals and performance metrics for the EPA programs

that have been assessed under PART in the 2004 and 2005 budget and the goals and performance metrics for these same programs developed under GPRA. Please provide an explanation of all instances where PART and GPRA program goals and performance metrics differ and OMB's rationale for deviating from GPRA to develop PART.

A3. As discussed above, the PART is simply a tool to ensure GPRA is implemented as intended. The PART is used to ensure, among other things, that program goals meet the high standards of GPRA. Where we find that existing goals do not meet those standards, agencies may be required to revise the goals associated with the programs being assessed.

I am assured that EPA conducts extensive outreach to Congress and consults with its stakeholders when developing goals, objectives, and performance measures under GPRA. In its Strategic Plan and Annual Performance Plans, EPA seeks to use the highest-quality and most outcome-oriented goals and measures for which valid performance information is expected to be available. OMB and EPA consider EPA's GPRA goals and measures to be the definitive set for Congress and the public to use to understand the agency's budget in performance terms and to hold the agency accountable for results.

The PART is not a substitute for GPRA. It is an assessment tool that informs management decisions, enhances organizational learning, and promotes effective strategies and program results. The PART is used to ensure, among other things, that program goals meet the high standards of GPRA. The PART process has been one of several drivers for improving the agency's performance measures. Some of the new measures identified during a PART assessment will become GPRA measures. In many cases, newly identified measures are not ready immediately for inclusion in GPRA documents, since it will take some time for the agency to conduct appropriate monitoring and data collection, to establish a baseline, and to set relevant targets. In these cases the agency develops specific plans, with milestones, for putting the necessary elements in place to use it as a GPRA measure. Each of the agency's program offices vets these measures with stakeholders, just as they do with any newly proposed measures.

Some performance measures, notably efficiency measures, which are identified under the PART process, are more appropriately used as management tools. In other cases, PART assessments have been conducted on a relatively small set of agency activities that are not readily identifiable as a distinguishable unit in GPRA documents. In these cases, new measures identified under the PART process may complement GPRA measures, but they are not necessarily in GPRA documents.

EPA included a discussion about the PART and performance measures in its most recent Annual Report, which we are including with this package (see pp. 12–13, *Using Program Evaluation* and *Improving Environmental Indicators, Performance Measurement, and Data Quality* and pp. 109–110, *Support for Environmental Results,* Fiscal Year 2003 Annual Report, U.S. Environmental Protection Agency). Also included with this package are summaries of all EPA programs assessed with the PART. EPA, in full consultation with stakeholders, has increased the percentage of externally reported annual performance measures based on environmental outcomes (as opposed to activity-based outputs) from seven percent in the FY 1999 Annual Performance Plan to 36 percent in the FY 2004 Annual Performance Plan.

Q4. OMB established two groups to consult with regarding the development of PART, the Performance Measurement Advisory Council and an Interagency Review Panel. What recommendations of these groups were adopted as revisions to PART for the 2005 budget presentation? What is the current status of these two groups and what role will they play in the making adjustments to PART for the 2006 budget? Please provide documentation of the date of meetings held between OMB and the PMAC and the IRP, a list of persons attending these meetings, and a brief description of the issues discussed.

A4. The Performance Measurement Advisory Council (PMAC) was established in June 2002 pursuant to the Federal Advisory Committee Act (FACA) to provide OMB with independent, expert advice relating to performance measurement. Pursuant to the statute, the PMAC's duration was limited to nine months and all the meetings were public. Minutes from those meetings are available on the OMB website at *http://www.whitehouse.gov/omb/budintegration/pmac_index.html.* The PMAC's recommendations are detailed in the meeting minutes.

In fall 2002, OMB established an interagency panel to review a sample of draft PARTS completed the first year, judge their consistency with the PART guidance, and make recommendations for how consistency could be improved. The panel also reviewed a selected number of disagreements between agency and OMB staff on

how particular questions in the PART had been answered. The panel's work reviewing draft PARTs is considered pre-decisional and therefore cannot be disclosed. In the two subsequent years of PART implementation, similar quality control exercises have been performed. In summer 2003, the National Academy of Public Administration convened a working group to assist OMB with the PART consistency check. This summer, OMB conducted the consistency check on its own. We would be happy to brief you in greater detail on the substance of the groups' work and the improvements that resulted from it.

ANSWERS TO POST-HEARING QUESTIONS

Responses by Paul Gilman, Assistant Administrator for Research and Development, United States Environmental Protection Agency

Questions submitted by Representative Zoe Lofgren

Q1. In relation to the proposed rule on mercury emissions from coal-fired electric utilities (Fed. Reg. Vol. 69, No. 2: Friday, January 30, 2004; pp. 4651–4752):

Q1a. Provide a list and a brief description of the studies relied upon by EPA to develop the proposed mercury cap-and-trade program prior to the release of the proposed rule in January. Please indicate the author/s of these studies and indicate where EPA has made the studies available for examination by the general public and Members of Congress.

A1a. EPA places all studies relied upon by EPA to develop the proposed and final rules in the docket. The Clean Air Mercury Rule docket can be found at http://docket.epa.gov/edkpub/index.jsp by searching for the docket ID OAR–2002–0056.

Q1b. Administrator Leavitt has recently announced his intention to initiate and/or obtain additional analysis on the proposed mercury regulation. What additional analyses will be undertaken? What aspects of the proposed mercury cap-and-trade program for electric utilities will be examined by these new analyses? Will the analyses be undertaken by EPA's Office of Air and Radiation or by EPA's Office of Research and Development? What is the anticipated date of completion for the additional analyses?

A1b. As Administrator Leavitt has clearly stated, EPA will make sure that we have all the analysis necessary to make the right decision about how to address mercury emissions from power plants.

During the comment period on the proposal, EPA received a number of relevant analyses from various groups, including both industry and environmental groups. These analyses address many of the key issues faced by EPA and will help inform the Agency's ongoing mercury work. They are available in EPA's docket, and the Agency is seeking public comment on these analyses in its Notice of Data Availability (NODA) released on November 30, 2004. The NODA is part of the EPA process toward delivering a final mercury rule by March 15, 2005.

EPA received a number of modeling analyses from various groups, including both industry and environmental groups. In some cases, EPA and commenters modeled the same or similar policy scenarios, sometimes using the same model, but obtained substantially different results due to differences in the assumptions employed. In these cases, model-input assumptions can be better understood by comparing and contrasting the modeling performed. The NODA shares these analyses and seeks additional comment on the models and assumptions used.

Administrator Mike Leavitt has outlined five guiding principles that provide context for additional inquiry and that narrows the focus of the Agency's deliberations. The five principles will ensure that the final mercury rule: (I) concentrates on the need to protect children and pregnant women from the health impacts of mercury; (2) stimulates and encourages early adopters of new technology that can be adequately tested and widely deployed across the full fleet of U.S. power plants utilizing various coal types; (3) significantly reduces total emissions by leveraging the $50 billion investment that the Clean Air Interstate Rule (CAIR) will require; (4) considers the need to maintain America's competitiveness; and (5) comprises one of many agency actions to reduce mercury emissions.

Q1c. What study or combination of studies led to EPA's assertion that the cap-and-trade mercury control program would reduce mercury emissions by 70 percent by 2015? What do EPA's analyses show in regard to the anticipated change in the geographic distribution of U.S. mercury emissions from coal-fired electric utilities if the cap-and-trade mercury control program were adopted as compared to the reductions anticipated if the MACT mercury control program were adopted?

A1c. The proposed mercury cap-and-trade program would place an emissions cap on mercury emissions from coal-fired electricity generating units. This cap would be implemented in two phases. The second phase of the program would begin in 2018, with a cap of 15 tons for emissions from these units. When this cap is fully implemented, emissions from affected units would be reduced by approximately 70 percent. The 15 ton cap represents a 70 percent reduction from the estimated 1999 level of 48 tons of mercury emissions from coal-fired electricity generating units.

Once the 15 tons cap is fully implemented, emissions would not exceed that level, because the cap and trade mechanism places an absolute limit on allowable emissions. Because the cap is lowered in 2018, cumulative emissions reductions under the proposed cap-and-trade program would exceed cumulative emissions reductions under the proposed MACT. Furthermore, EPA analyses suggest that the proposed cap-and-trade program attains more reductions from larger and higher emitting facilities than the proposed MACT.

An important feature of the proposed mercury cap-and-trade program is the ability for sources to bank emissions allowances. Sources can over-comply with the program in one period and bank remaining allowances for use in a later period. Banking of allowances provides flexibility to sources, encourages earlier or greater reductions than required, stimulates the market, and encourages efficiency. By encouraging early reductions, banking provides early human health and environmental benefits relative to what would occur otherwise, though it results in extending the time until the cap is reached. We expect that sources will take advantage of the banking provision under the mercury cap-and-trade program by beginning to reduce emissions soon after the program takes effect. Allowing banking should not affect the cumulative mercury reductions achieved under the program.

Questions submitted by Democratic Members

Q1. EPA's budget presentation includes program funding request changes for FY 2005 relative to the Administration's FY 2004 budget request. Please provide the changes for the following programs relative to the FY 2004 enacted appropriations for EPA including the funding level received in the FY 2004 enacted appropriations law and the requested funding level for FY 2005. In cases where a decrease in funding is proposed include a description of the activities proposed for termination. In cases where and increase in funding is proposed, include a description of the new or expanded activities that will be undertaken.

Q1a. Office of Research and Development (ORD) research and development funding for mercury.

A1a. Mercury Research, EPA's Office of Research and Development.

(Dollars in Millions)

FY 2004 Enacted	FY 2005 Request	Increase/Decrease
$6.9	$5.2	-$1.7

EPA will maintain in-house research in this area, but plans to award five fewer Science to Achieve Results (STAR) grants for mercury research in FY 2005.

Q1b. Office of Air and Radiation (OAR) research and development funding for mercury

A1b. In the Science and Technology Appropriation in the FY 2004 Operating Plan, OAR has $361,700 for mercury activities; OAR has requested $361,700 in the FY 2005 President's Budget. This funding supports the regulatory and guidance programs within OAR for mercury.

Q1c. ORD research and development funding on fine particulates.

A1c. Particulate Matter Research, EPA's Office of Research and Development

(Dollars in Millions)

FY 2004 Enacted	FY 2005 Request	Increase/Decrease
$58.6*	$63.7	$5.1

*Does not reflect $2M reduction to fund the Clean Automotive Technology Program as directed by Congress in FY 2004.

The increase in resources will provide funding for a recently awarded 10-year, $30 million Science to Achieve Results (STAR) grant to study the connection between

long-term exposure to air pollution and cardiovascular disease. The balance of the resources will support STAR research examining emerging biological mechanisms that can explain observed health effects associated with exposure to PM.

The findings from these studies will assist policy-makers in understanding the public health consequences of long-term exposure to air pollutants, and will contribute important information for PM standard setting by increasing our understanding of the biological plausibility of reported effects; the effects of PM and co-pollutants; who is most susceptible to these effects; and the effects of long-term exposure to PM. All these subjects are highlighted in the 2001 NRC Report IV on PM research priorities.

Q1d. Office of Air and Radiation (OAR) research and development funding for fine particulates.

A1d. In the Science and Technology Appropriation in the FY 2004 Operating Plan, OAR has $33,009,800 for fine particulates activities; OAR has requested $42,762,500 in the FY 20005 President's Budget, This funding supports the regulatory and guidance programs within OAR, particularly the Mobile Source program.

Q1e. ORD research and development funding on ozone.

A1e. Tropospheric Ozone Research, EPA's Office of Research and Development

(Dollars in Millions)

FY 2004 Enacted	FY 2005 Request	Increase/Decrease
$5.1	$4.9	-$0.2

The decrease is due to a realignment of research support resources, and there is no programmatic impact to this research effort.

Q1f. Office of Air and Radiation (OAR) research and development funding for ozone

A1f. In the Science and Technology Appropriation in the FY 2004 Operating Plan, OAR has $34,167,3000 for ozone activities; OAR has requested $36,224,400 in the FY 2005 President's Budget. This funding supports the regulatory and guidance programs within OAR, particularly the Mobile Source program.

Q2. The FY 2005 Budget Request describes the Green Suppliers Network (GSN) activity within the pollution Prevention Program. How much funding does EPA intend to provide in FY 2005 to support this partnership program and meet the goals of expanding the GSN partnerships to include four additional industry sectors? How much funding did EPA supply to support the GSN pilot effort in 2002? What were the funding levels for this activity in 2003 and 2004?

A2. The promise of the Green Suppliers Network (GSN) is best illustrated by the response to it by industry. The program is not yet a year old and already countless Original Equipment Manufacturers and their suppliers have joined the program. It is truly a win-win for all involved. The Original Equipment Manufacturers benefit because the program is designed to improve their supply chains both economically and environmentally. Small businesses benefit because they are being shown opportunities to lean their operations and improve their environmental footprints, while at the same time achieving significant cost savings. The states benefit because the small businesses and their clients located within their jurisdictions remain competitive, leading to job retention and viability within the state's economy. EPA and the environment benefit because the GSN outlines direct opportunities for environmental improvement from energy savings to waste minimization to the reduction in the use and emissions of toxic chemicals.

When the program was launched, EPA did not expect the response from industry to be so strong and so immediate. Currently, The Green Suppliers Network is partnering with the Automotive Industry, the Aerospace Industry, the Office Furniture Industry and the Healthcare/Pharmaceutical Industry. However, EPA has been approached by several other industries which have shown an interest in participating in the program. The Transportation Industry represented initially by AMTRAK is already engaged in a pilot program with GSN. The Farm Machinery Industry, represented by John Deere and others have written EPA with an interest in participating. The Trucks and Buses industries have also registered interest and most recently, the Retail Industry is opening a dialogue with EPA on this program. Additional resources are needed to ensure that the technical information the GSN

program offers is well packaged and effectively delivered to these new industries. Each industry that participates in this program is different and must first identify a list of suppliers within their supply chains which will benefit most from the program. Consequently, for each of these four industrial sectors, we could be addressing as many as 100 small to medium sized enterprises located across the United States. EPA, in partnership with NIST and the State Technical Assistance Providers, must make sure that they can deliver the GSN program effectively and consistently to all of these suppliers. This will require cross-training, more extensive communication and planning and the tailoring of existing lean and clean tools to these new suppliers. Additional resources are needed to ensure that EPA can successfully merge lean technologies and environmental technical assistance for delivery to this extended supply chain. Moreover, GSN has attracted the attention of foreign governments such as Canada and China, arid resources will be used to build a foundation for GSN implementation there.

With additional resources one should expect to see measurable results from numerous small to medium sized enterprises and their Original Equipment Manufacturers that are aggregated and ready to be reported in the near-tern. The results are collected from individual suppliers by the Manufacturing Extension Partnership program of NIST and aggregated for EPA. The results are measured through the tools that the NIST MEPs use in conducting an assessment. This includes, for example, the use of a tool called Value Stream Mapping which creates a material and information flow map of a product or process. This powerful tool allows companies to map the flow of products and information from order to cash as well as through the supply chain. Kaizen is another tool that is used to monitor and measure continuous improvement. These lean manufacturing tools and the environmental considerations that are being built into them through GSN are designed to measure improvements as the process changes they recommend are implemented. Results measured by these systems include pollution reductions, crater and energy savings, and company cost savings associated with those environmental benefits. These results will contribute to achievement of new results-oriented Pollution Prevention annual performance measures incorporated into EPA's FY 2003 President's Budget Request anal related Goal 5 Strategic Targets in EPA's Strategic Plan for 2003–2008.

Please see the table below for the requested funding levels.

Fiscal Year	Total Funding Level
2005 Presidents Budget	$1,895,000.0
2004 Enacted	$485,000.0
2003 Enacted	$404,400.0
2002 Enacted	$213,100.0

Q3. Do the goals, program definitions, and performance measures for research programs that EPA has developed and included in its strategic plan align with the goals, program definitions, and performance measures associated with OMB's PART analysis? How will the discrepancies be addressed?

A3. The three EPA research programs that were reviewed through OMB's Program Assessment Rating Tool (PART) analysis for the FY 2005 budget represent research programs as defined by EPA, each with its own multi-year research plan. These three programs (Particulate Matter Research, Ecosystems Protection Research, and Pollution Prevention Research) received PART scores of "Results Not Demonstrated" because the Agency and OMB were unable to reach agreement regarding appropriate outcome-oriented goals and measures. For this reason, the PART worksheets for these programs note that goals and measures are under development. EPA is continuing to work with OMB to develop and identify appropriate outcomes for environmental research.