



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

January 16, 1984

OFFICE OF  
THE ADMINISTRATOR

Mr. William D. Ruckelshaus  
Administrator  
Environmental Protection Agency  
Washington, D.C. 20460

Dear Mr. Ruckelshaus:

The Executive Committee of the Science Advisory Board (SAB) has completed its review of the Research Outlook 1984. In May 1983, a subcommittee of the Executive Committee reviewed the Office of Research and Development's (ORD) research strategies and in early October reviewed the draft Research Outlook 1984. In December 1983, a subgroup of the Executive Committee reviewed the final draft of Research Outlook 1984. The entire Executive Committee has reviewed and approved the subgroup's comments.

The ORD staff were responsive to many of the SAB's comments last year, and they incorporated much of this advice into this year's Outlook. However, they were not in a position to act on the SAB's advice concerning modification of the research planning process. The SAB believes that the current process, of which the Research Outlook is one output, fails to identify and discuss many potentially creative research alternatives. The failure results because research planning within ORD is driven by the budget process rather than being used to guide the development of a budget. While it is naive to assume that strategic research planning will be driven solely by the research needs of emerging environmental issues, it is even more naive to assume that a viable and effective research plan can be developed and articulated when driven only by the budget and its limitations. The emerging environmental problems and their associated research needs are the forces which must guide the construction of a research plan and inform the budgetary process.

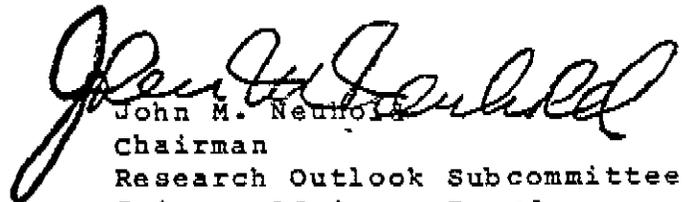
The members of the Science Advisory Board's Executive Committee strongly believe that, if the research planning process is not changed, production of a five-year research plan should be discontinued. It is a waste of ORD's time to prepare the document and a waste of the SAB's time to review it as it presently stands.

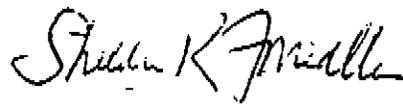
The SAB strongly recommends that the Office of Research and Development reinstate an effort similar to the Environmental Outlook effort of 1980 as an integral part of the strategic planning process. The Environmental Outlook 1980 was an assessment of future environmental trends, which provided those involved in the long-range planning process with an overview of likely environmental futures and an interpretation and analysis of potentially significant future environmental problems. This type of effort is badly needed in EPA at the present time.

Although the overall construction of the Research Outlook 1984 lacked a sense of strategic mission, some individual chapters did not. The chapters on Air and Acid Rain were internally coherent in both the short and long-term sense. However, the chapter on Cross-Cutting Issues confused managerial issues, such as quality control, with exploratory research. Also distressing was the subjugation of exploratory and long-term research issues to the broader chapter categories of air, water, etc. Although these other research categories do have exploratory and long-term research needs, exploratory research is important enough to merit its own chapter. Redundancy would not hurt in this case. Exploratory research is the one area in which creative and potentially "break through" types of research can go on. In addition, it is a ready vehicle for bringing outside talent to bear on the Agency's problems.

More detailed comments on the Research Outlook 1984, prepared by a subcommittee of the SAB, are attached to this letter. The SAB appreciates the opportunity to be involved earlier in ORD's research planning process and hopes that its comments will serve to improve the overall scope and quality of the research program.

Sincerely,

  
John M. Neuhoff  
Chairman  
Research Outlook Subcommittee  
Science Advisory Board

  
Sheldon K. Friedlander  
Acting Chairman  
Science Advisory Board

Attachment

Attachment 1

Chapter-by-Chapter Comments

Cross-Cutting Issues

- The introductory chapter of the Research Outlook should state the rationale and the goals of the entire research program.
- Quality assurance is listed as the most important "cross-cutting" research issue. Yet quality assurance and quality control are management issues not research issues. There is no statement as to the impact of such a mandated program on research and whether or not the quality assurance plan would withdraw money from research funds. Quality assurance would better fit into a discussion of methods or implementation.
- Risk assessment and risk management need to be better defined in this chapter. Although risk assessment is a universal, cross-cutting issue, the Research Outlook does not address it in more than a provincial manner. EPA should continue to develop its technical ability to carry out risk assessment, e.g., the acquisition of data and the application of data to calculation of risks. Research into specific components of risk assessment, particularly the development of mathematical models to estimate human dosimetry, should be a high priority. The risk assessment research plan should be broadened to include all areas of risk assessment and should not be limited to the few cited. Refinement of risk estimates is a major need which can only come from basic research into such areas as mechanism of action.
- In the groundwater monitoring area, there is the need to identify and record the presence of multi-aquifer wells because of the problems of cross flow from one to another.

Hazardous Wastes

- A clear statement of the overall research goals of the hazardous waste research program should be made. Such a statement would allow those outside the Agency

to gain a clearer perspective of the interrelationship of the overall research program and its relative priority.

- The Research Outlook should state more emphatically that research funds are needed to support Superfund activities. Without research, limited abatement alternatives are available based on current, not advancing, technologies. The Subcommittee recommends that there be a change in the Superfund statute to permit research to support Superfund activities.
- In the area of securing landfills, coordination with private sector research should be encouraged to assure that ORD is not duplicating research efforts being carried out in the private sector.
- There should be some social science research and public education in the area of hazardous waste siting. It is essential that technical information be explained to a lay audience in a way which they can understand.
- Much of the toxicology of hazardous substances is unknown because the most hazardous compounds are not commercial products. There should be a major effort in the study of large volume by-products as opposed to large volume commercial chemicals.

#### Toxic Substances and Pesticides

- There appears to be no concern for metabolism in the structure activity relationships (SAR) program. SAR should include metabolism to reactive intermediates. The chemical reactivity of the intermediates is now recognized as critical in the toxicity of the parent compound. SAR studies are of little value without metabolism.
- There is not sufficient attention to control of toxic substances before they enter the environment. The control technology area is very weak.

#### Drinking Water

- There is insufficient emphasis in the Research Outlook on the protection of surface water systems. The issue of surface water modeling is also not given enough priority.

- There should be some mention of developing technologies to investigate the condition of water supply systems. Diagnostic techniques and the ability to detect changes in the system are very important.
- An important issue is the health effects of extremely low trace levels of toxicants. Much of the health advisory data used by EPA is based on indirect information from industrial inhalation toxicity data. The generation of basic information on metabolism and kinetics of metabolism, redistribution and covalent binding at ultra trace levels of toxicants is particularly important. Without this type of data, the use of "safety factors" as a general statement of ignorance will have to continue.

#### Water Quality

- There is no mention of a continuous monitoring system in this chapter.
- Non-point source pollution should be a high priority research area.

#### Air

- This chapter is well described and is an improvement over the discussion of air issues in previous years of the document. Particularly, the extrapolation modeling, lung disease, cancer, indoor air, and hazardous pollutant issues are examples of research needs that are more straightforwardly stated and which, if addressed, are more responsive to the regulatory needs of EPA than in the past.
- Indoor air pollution is one area in which epidemiological research should be initiated, especially for NO<sub>2</sub>.
- In the area of hazardous air pollutants, high volume commodity chemicals may not be as important as high volume chemicals that are intermediates in the processes leading to these high volume commodity chemicals. There is not much toxicological data on these compounds; if such compounds are identified as important air pollutants, a major health effects initiative will be required to estimate the human health risk involved.

- There does not appear to be any planning for research on visibility. Some long-term research should be initiated in this area.

#### Acid Rain

- No mention is made of any component of the program dealing with cloud chemistry. The document should state whether this issue is being addressed by EPA or another Federal agency.
- It is unclear in this chapter whether any research is being done on the conversion of SO<sub>2</sub> to SO<sub>3</sub> within the boiler itself, and if so, to what extent that conversion is being considered.
- There should be some explicit comments about potential cost/benefit analyses and how the Agency plans to deal with cost effective control strategies.
- A short paragraph outlining what parts of the research in acid rain are carried out by other agencies would be helpful in putting EPA's research into perspective.

#### Energy

- This chapter does not address the important area of fluidized bed coal combustion.
- It is unclear in this chapter how EPA is taking advantage of the lull in the energy crisis in carrying out its research in the energy area.

#### Exploratory Research

- This important research area should be considered in a separate chapter, even if that leads to some redundancy.
- The SAB feels strongly that the area of exploratory, long-term research should have additional funds. Exploratory research is the only area in which creative and possibly "break through" research can be carried out. The exploratory research program is one vehicle for getting outside talent to focus on EPA's research problems.