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OFFICE OF
RESEARCH AND DEVELOPMENT

PROGRAM GUIDE

FISCAL YEAR 1977

October 1976 - September 1977

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

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OFFICE OF RESEARCH AND DEVELOPMENT
PROGRAM GUIDE

Introduction

The U.S. Environmental Protection Agency (EPA) was created by Presidential order in December of 1970. This order brought together 15 programs scattered among several Federal Government agencies to mount a coordinated attack on environmental problems. These problems include air and water pollution, solid waste management, pesticides, radiation, noise and toxic substances.

In support of the Agency's mission the Office of Research and Development (ORD) conducts a comprehensive and integrated research and development (R&D) program to provide:

— The scientific and technical base for reasonable standards and regulations.

— Standardized methods to measure and assure quality control in programs to assess environmental quality, implement regulations and enforce standards.

— Cost-effective pollution control technology and incentives for acceptance of environmentally sound options.

— Scientific, technical, socio-economic and institutional methodologies needed to judge environmental management options and balance these options against competing national needs.

ORD's research is supplemented by general scientific and technical research in other federal agencies, colleges and universities and elsewhere. ORD also supports the Agency's involvement in many international organizations with mutual environmental R&D concerns.

More general functions of ORD include: (1) maintenance of in-house expertise capable of quickly responding to emergencies and giving expert consultation and testimony when necessary; (2) sharing the results of environmental R&D with a wide range of individuals, groups, and agencies in ways that are meaningful and practical; and (3) giving expert scientific and technical assistance to other EPA offices to help them formulate environmental policy.

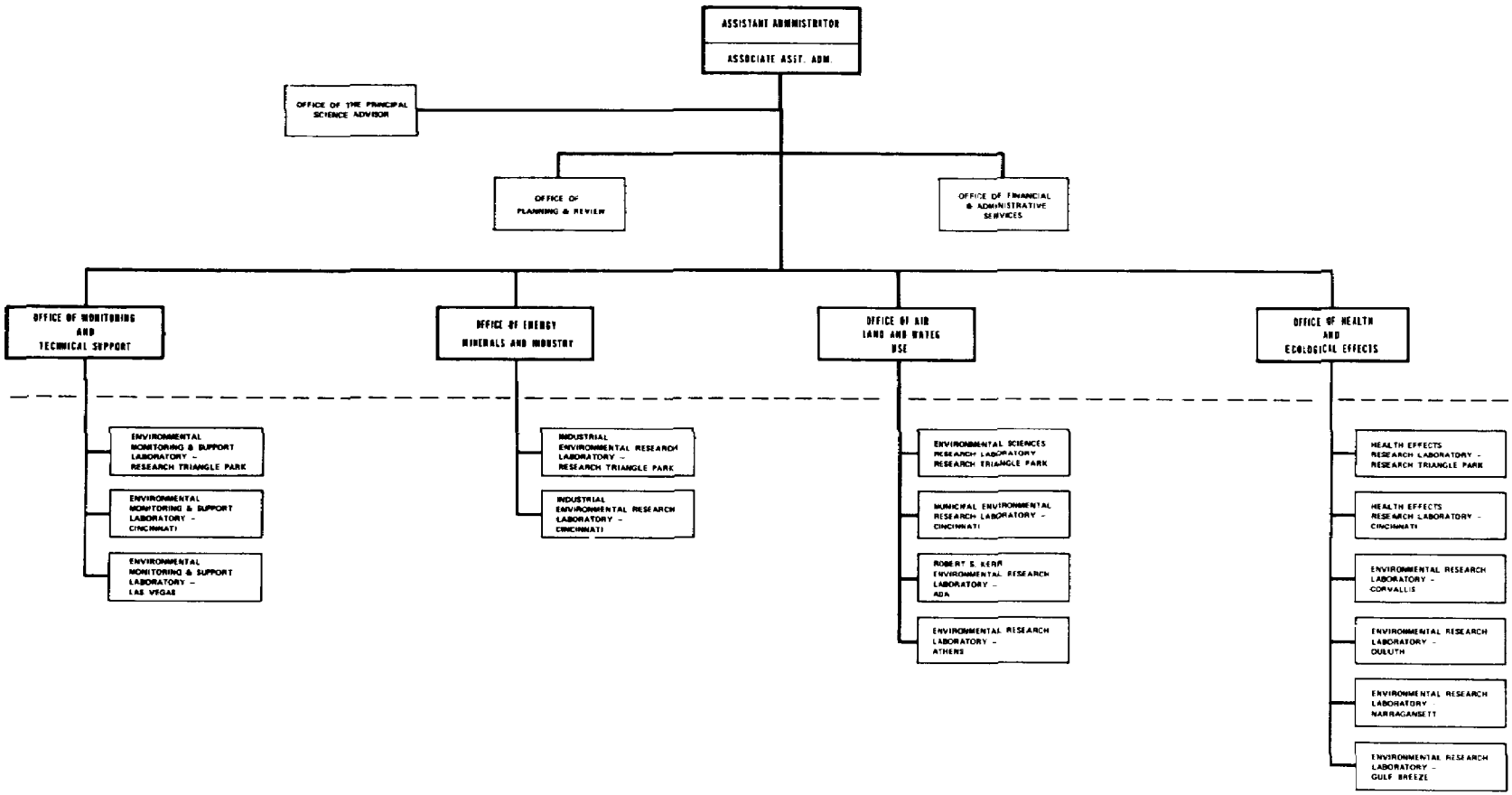
The purpose of this Program Guide is three-fold: First, to acquaint the research and development community with the organizational structure of the Office of Research and Development — PART I; second, to make public the Office of Research and Development's extramural research program objectives for fiscal year 1977 — PART II; and third, to provide general guidelines necessary when developing grant or contract applications — PART III.

Hand out copies of this Program Guide are available from the EPA's ten regional offices (see Appendix D), from ORD's fifteen associated laboratories throughout the country, and from the Office of Research and Development, Headquarters, Washington, DC. Mail requests should be sent to:

Office of Financial & Administrative Services (RD-674)
Office of Research and Development
Environmental Protection Agency
Washington, DC 20460

Anyone wishing to receive future editions of this Program Guide should complete and return the form located at the back of this publication (Appendix E).

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT



PART I

OFFICE OF RESEARCH AND DEVELOPMENT
ORGANIZATIONAL DIRECTORY

The Office of Research and Development is responsible for the development, direction, and conduct of a national research, development, and demonstration program in pollution sources, fate, and health and welfare effects; waste management and utilization technology; environmental sciences; and monitoring systems. The Assistant Administrator for Research and Development also serves as principal science advisor to the Administrator and coordinator for the Agency's policies and programs concerning carcinogenesis and related problems.

	Headquarters Mail Code*	Telephone**
Assistant Administrator for Research and Development **Wilson K. Talley**	RD-672	(202) 755-2600
Associate Assistant Administrator Carl R. Gerber	RD-672	(202) 755-0122
Office of Financial and Administrative Services Director, Alan Neuschatz	RD-674	(202) 426-2355
Office of Planning and Review Director, Phyllis A. Daly	RD-675	(202) 755-2606
Office of the Principal Science Advisor Principal Physical Science Advisor, Herbert Wiser	RD-676	(202) 755-0477
Principal Engineering Advisor, William Lacy	RD-676	(202) 755-0464
Senior ORD Official, Cincinnati David G. Stephan		(513) 684-4402
Support Services Office Director, Robert N. Carr		(513) 684-7966
Environmental Protection Agency Cincinnati, OH 45268		
Senior ORD Official, Research Triangle Park John H. Knelson, M.D.		CML (919) 549-8411 FTS 629-2281
Support Services Office Director, Paul A. Kenline		CML (919) 549-8411 FTS 629-2613
Environmental Protection Agency Research Triangle Park, NC 27711		

OFFICE OF RESEARCH AND DEVELOPMENT
ORGANIZATIONAL DIRECTORY

Office of Monitoring and Technical Support

The Office of Monitoring and Technical Support is responsible for the development and demonstration of monitoring systems; quality control of pollutant measurement and monitoring techniques (quality assurance); technical information dissemination; and technical support services.

	Headquarters Mail Code*	Telephone**
Deputy Assistant Administrator **Albert C. Trakowski, Jr.**	RD-680	(202) 426-2202
Associate Deputy Assistant Administrator H. Matthew Bills	RD-680	(202) 426-4453
Program Operations Staff Director, Ross K. Robeson	RD-680	(202) 755-6403
Regional Services Staff Director, Michael L. Mastracci	RD-680	(202) 755-9210
Monitoring Technology Division Director, (Vacant)	RD-680	(202) 426-2026
Technical Support Division Director, William A. Cawley	RD-680	(202) 426-2382
Technical Information Division Director, W. Randall Shobe	RD-680	(202) 245-3018
Technology Transfer Staff Director, Robert Crowe		(513) 684-4388
Environmental Protection Agency 5555 Ridge Avenue Cincinnati, OH 45268		
Technical Information Office – Cincinnati Director, Gilbert Gigliotti		(513) 684-7551
Environmental Protection Agency Cincinnati, OH 45268		
Environmental Monitoring and Support Laboratory **Director, S. David Shearer**		CML (919) 549-8411 FTS 629-2106
Deputy Director, Thomas Hauser		CML (919) 549-8411 FTS 629-2106
Environmental Protection Agency Research Triangle Park, NC 27711		

OFFICE OF RESEARCH AND DEVELOPMENT
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	Telephone**	
Environmental Monitoring and Support Laboratory		
Director, Dwight G. Ballinger	(513)	684–7301
Deputy Director, Robert L. Booth	(513)	684–7301
Environmental Protection Agency Cincinnati, OH 45268		
Environmental Monitoring and Support Laboratory	CML (702)	736–2969
Acting Director, George B. Morgan	FTS	595–2969
Deputy Director (Vacant)		
Environmental Protection Agency P. O. Box 15027 Las Vegas, NV 89114		
Vint Hill Field Station P. O. Box 1587 Building 166 Warrenton, VA 22186	(703)	347–6224

OFFICE OF RESEARCH AND DEVELOPMENT
ORGANIZATIONAL DIRECTORY

Office of Energy, Minerals, and Industry

The Office of Energy, Minerals, and Industry is responsible for the assessment and the development of methods for control of the environmental and socio-economic impacts of energy and mineral resource extraction, processing, conversion, and utilization systems and of other industrial operations.

	Headquarters Mail Code*	Telephone**
Deputy Assistant Administrator **Stephen Gage**	RD-681	(202) 755–4857
Associate Deputy Assistant Administrator Steven R. Reznek	RD-681	(202) 755–4857
Program Operations Staff Director, Everett Lemley	RD-681	(202) 426–2507
Energy Coordination Staff Director, Clinton W. Hall	RD-681	(202) 426–4567
Energy Processes Division Director, Frank T. Princiotta	RD-681	(202) 755–0205
Industrial and Extractive Processes Division Director, Kurt Jakobson (Acting)	RD-681	(202) 755–9014
Industrial Environmental Research Laboratory **Director, John K. Burchard**		CML (919) 549–8411 FTS 629–2821
Deputy Director, Norbert Jaworski		CML (919) 549–8411 FTS 629–2821

Environmental Protection Agency
Research Triangle Park, NC 27711

OFFICE OF RESEARCH AND DEVELOPMENT
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	Telephone**	
Industrial Environmental Research Laboratory		
Director, David G. Stephan	(513)	684-4402
Deputy Director, Richard E. Harrington	(513)	684-4438
Environmental Protection Agency 5555 Ridge Avenue Cincinnati, OH 45268		
Oil and Hazardous Materials Spills Branch, Edison, NJ Environmental Protection Agency Edison, NJ 08817	CML (201) FTS	548-3347 342-7508
Mining Technology Branch, Rivesville, WV P. O. Box 5555 Rivesville, WV 26588	CML (304) FTS	278-5376 923-7496
Food and Wood Products Branch, Corvallis, OR 200 SW 35th Street Corvallis, OR 97330	CML (503) FTS	752-4211 420-4694

OFFICE OF RESEARCH AND DEVELOPMENT
ORGANIZATIONAL DIRECTORY

Office of Air, Land, and Water Use

The Office of Air, Land, and Water Use is responsible for the development and demonstration of cost-effective methods for the prevention or management of pollutant discharge or waste disposal into the environment, except those related to energy, minerals, or industrial processes.

	Headquarters Mail Code*	Telephone**
Deputy Assistant Administrator **Thomas A. Murphy**	RD-682	(202) 426–0803
Associate Deputy Assistant Administrator (Vacant)	RD-682	(202) 426–0803
Program Operations Staff Director, William Frietsch	RD-682	(202) 426–4255
Agriculture and Non-Point Source Management Division Director, Darwin R. Wright	RD-682	(202) 426–2407
Waste Management Division Director, William Rosenkranz	RD-682	(202) 426–2260
Media Quality Management Division Director, Courtney Riordan	RD-682	(202) 426–1532
Environmental Sciences Research Laboratory **Director, A. Paul Altshuller**		CML (919) 549–8411 FTS 629–2191
Deputy Director, Alfred Ellison		CML (919) 549–8411 FTS 629–2191
Environmental Protection Agency Research Triangle Park, NC 27711		
Regional Air Pollution Study Field Office 11640 Administration Drive St. Louis, MO 63141		CML (314) 425–7022 FTS 279–7022

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	Telephone**	
Municipal Environmental Research Laboratory		
Director, Francis T. Mayo	(513)	684–7951
Deputy Director, Louis W. Lefke	(513)	684–7953
Environmental Protection Agency Cincinnati, OH 45268		
Lebanon Pilot Plant Route 2, Box 7-A Glosser Road Lebanon, OH 45036	CML (513) FTS ask for (513)	932–4951 684–2000, 932–4951
EPA-DC Pilot Plant 5000 Overlook Avenue, SW Washington, DC 20032	CML (202) FTS	562–6200 755–4939
Robert S. Kerr Environmental Research Laboratory	CML (405)	332–8800
Director, William C. Galegar	FTS	743–2224
Deputy Director, Marvin L. Wood	CML (405) FTS	332–8800 743–2226
Environmental Protection Agency P. O. Box 1198 Ada, OK 74820		
Environmental Research Laboratory	CML (404)	546–3134
Director, David W. Duttweiler	FTS	289–3134
Deputy Director, Henry F. Enos	CML (404) FTS	546–3430 289–3430
Environmental Protection Agency College Station Road Athens, GA 30601		

OFFICE OF RESEARCH AND DEVELOPMENT
ORGANIZATIONAL DIRECTORY

Office of Health and Ecological Effects

The Office of Health and Ecological Effects is responsible for the development of health and ecological data needed for the establishment of standards and criteria or guidelines for those components of the environment in which specific pollutants or activities may require control.

	Headquarters Mail Code*	Telephone**
Deputy Assistant Administrator **Delbert Barth**	RD-683	(202) 755-0820
Associate Deputy Assistant Administrator Andrew McErlean	RD-683	(202) 755-0638
Program Operations Staff Director, Harry Thron	RD-683	(202) 755-0611
Health Effects Division Director, (Vacant)	RD-683	(202) 755-9723
Ecological Effects Division Director, (Vacant)	RD-683	(202) 755-0649
Criteria Development and Special Studies Division Director, Roger S. Cortesi	RD-683	(202) 426-4637
Health Effects Research Laboratory **Director, John H. Knelson, M.D.**		CML (919) 549-8411 FTS 629-2281
Deputy Director, Robert E. Lee, Jr.		CML (919) 549-8411 FTS 629-2281
Environmental Protection Agency Research Triangle Park, NC 27711		
Wenatchee Research Station P. O. Box 73 Wenatchee, WA 98801		CML (504) 663-0031 FTS 446-0243

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	Telephone**	
Health Effects Research Laboratory		
Director, John Garner	(513)	684–7401
Deputy Director, James Lucas, M.D.	(513)	684–7401
Environmental Protection Agency Cincinnati, OH 45268		
Recreational Water Quality Criteria Group Environmental Protection Agency South Ferry Road Narragansett, RI 02882	CML (401) FTS	789–1071 838–4843
Environmental Research Laboratory	CML (503)	757–4601
Director, A. F. Bartsch	FTS	420–4601
Deputy Director, Earl Kari	CML (503) FTS	757–4601 420–4601
Environmental Protection Agency 200 SW 35th Street Corvallis, OR 97330		
Newport Field Station Marine Science Center Newport, OR 97365	CML (503) FTS (503)	867–4031 423–4111, ask for 867–4031
Ely Field Station 222 West Conan Street Ely, MN 55731	CML (218) FTS (218)	365–5280 725–4242, ask for 365–5280
Western Fish Toxicology Station 1350 SE Goodnight Avenue Corvallis, OR 97330	CML (503) FTS	757–4735 420–4735
Arctic Environmental Research Station College, AK 99701	CML (907) FTS (907)	479–7728 399–0150, ask for 479–7728
Environmental Research Laboratory	CML (218)	727–6692
Director, Donald I. Mount	FTS	783–9550
Deputy Director, David Yount	CML (218) FTS	727–6692 783–9549

OFFICE OF RESEARCH AND DEVELOPMENT
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	Telephone**
Environmental Protection Agency 6201 Congdon Boulevard Duluth, MN 55804	
Newtown Fish Toxicology Station 3411 Church Street Cincinnati, OH 45244	(513) 684–8601
Monticello Field Station Box 500 Monticello, MN 55362	CML (513) 295–5145 FTS None
Large Lakes Research Station 9311 Groh Road Grosse Ile, MI 48138	CML (313) 675–5000 FTS 226–7811
Environmental Research Laboratory **Director, Eric D. Schneider**	CML (401) 789–1071 FTS 838–4843
Deputy Director, (Vacant)	
Environmental Protection Agency South Ferry Road Narragansett, RI 02882	
Environmental Research Laboratory **Director, Thomas W. Duke**	CML (904) 932–5311 FTS None
Deputy Director, Tudor Davies	CML (904) 932–5311 FTS None
Environmental Protection Agency Sabine Island Gulf Breeze, FL 32561	
Bears Bluff Field Station Box 368 Johns Island, SC 29455	CML (803) 559–0371 FTS 577–4171, ask for (803) 559–0371

*The Office of Research and Development Headquarters mailing address is — Environmental Protection Agency, Washington, DC 20460. Headquarters mail should also include the Mail Code.

**Telephone numbers are both commercial and Federal Telecommunications System (FTS) unless otherwise indicated.

PART II

OFFICE OF RESEARCH AND DEVELOPMENT FISCAL YEAR 1977 RESEARCH PROGRAM

The Office of Research and Development (ORD) establishes its objectives and priorities in response to the overall mission and priorities of EPA and is highly mission-oriented, concerned with solving specific priority problems rather than only advancing scientific knowledge. Although the scope of ORD projects may vary from quite fundamental research to the full-scale engineering demonstration of new pollution control processes, all projects are directed at meeting specified objectives. While unsolicited proposals and grant applications may be submitted on any subject at any time (see Part III), all these proposals will be evaluated in the context of these pre-established research objectives.

In ORD's planning process research objectives are grouped into five major program areas. These are: Health and Ecological Effects, Energy, Industrial Processes, Public Sector Activities, and Monitoring and Technical Support. Each program area is further divided into one or more subprogram areas or program elements. The relationship between ORD's planning structure and EPA's budget structure is shown in Appendix A.

After research objectives have been defined and approved by ORD and other Agency components, they are formally documented by ORD in planning documents called "Accomplishment Plans." Each Accomplishment Plan summarizes a specific research objective to be pursued by one or more of ORD's fifteen laboratories. While these Accomplishment Plans describe the research objectives desired, they do not contain detailed information on the individual mechanisms or projects required to attain the desired results. This detailed planning is the responsibility of the Laboratory Director.

The following pages in Part II describe all fiscal year 1977 Accomplishment Plans which have funds reserved that will be expended through the grant or contract process. The laboratory or laboratories responsible for each Accomplishment Plan are shown. Contact with ORD's laboratories concerning these plans and objectives is encouraged.

HEALTH AND ECOLOGICAL EFFECTS PROGRAM AREA

The Health and Ecological Effects Program Area is fundamental to EPA's responsibility to set criteria, standards and guidelines to protect and enhance environmental quality. Scientific information on human health effects of pollutants and ecosystem structure is essential in development of environmental quality standards and effective pollution control strategies. The link between existence of a damaging pollutant and the way it entered the environment must also be understood by policy-makers. That is why research on pollutant transport and fate is essential.

The Health and Ecological Effects Program provides information for establishment and reevaluation of water quality criteria, air quality criteria, ocean disposal criteria, pesticide registration guidelines, effluent standards for toxic and hazardous materials and radiation standards. This program contains three subprograms: Health Effects, Ecological Processes and Effects, and Transport and Fate of Pollutants.

HEALTH EFFECTS SUBPROGRAM

Health effects research is directed toward the assessment of health hazards associated with environmental pollution from a number of media and categories including air, water, pesticides, radiation, etc. Within this program, research problems are classified on the basis of exposure, or the way in which pollutants reach man. In taking environmental action to protect human health, exposure to specific contaminants, not effect, is regulated. Three primary categories are used in the problem classification: "Air Exposures and Their Effects" which deals with contaminants reaching man primarily in air, "Water Exposures and Their Effects" which deals with contaminants reaching man primarily in water, and "Multi-Route Exposures and Their Effects" which addresses pollutants which commonly reach man by a variety of routes of exposure.

Air Exposures & Their Effects: Refinement of Public Health Risk Assessment on Regulated and Non-Regulated Pollutants Specifically Associated With Transportation — 601B

Extramural Funds: $2,265,000

Accomplishment Plan Summary: This Accomplishment Plan is part of a multidisciplinary research program begun in fiscal year 1975 focusing on the public health consequences of non-regulated pollutants from mobile sources. The program is designed to provide timely decision-making input to the EPA regarding sulfuric acid and other non-regulated pollutants from mobile sources as promised to the Congress in November 1973. The emphasis is on the evaluation of non-regulated emissions from advanced automotive control systems (principally, but not restricted to, catalysts) so as to ensure protection of the public health and welfare.

Laboratory Assignment: Environmental Sciences Research Laboratory, Research Triangle Park
Health Effects Research Laboratory, Research Triangle Park
Health Effects Research Laboratory, Cincinnati

Air Exposures and Their Effects: Refinement of Health Information on Pollutants for Which Ambient Air Quality Standards Have Been Developed — 601C

Extramural Funds: $3,145,600

Accomplishment Plan Summary: To evaluate the efficacy of existing Ambient Air Quality Standards (AAQS), certain health information is required to close research gap areas existing at the time that the health

criteria for SO_2, CO, TSP, Ox and HC were compiled. This Accomplishment Plan is directed toward building on information which has become available, since the criteria were compiled in a way that will provide a scientifically adequate health data base for refining the existing criteria.

The emphasis needed in this work is an evaluation of exposure averaging times for AAQS and of the adequacy of existing safety margins. Emphasis is also given for determining the health benefits of meeting the AAQS and the health risks of exceeding the AAQS on a time-weighted basis. Pollutants to be studied include: NO_2, Ox, particulates, SO_2, and CO.

Laboratory Assignment: Health Effects Research Laboratory, Research Triangle Park

Air Exposures and Their Effects: Identification of the Health Implications of Exposure to Non-Criteria Pollutants Reaching Man Primarily in Air — 601D

Extramural Funds: $2,330,900

Accomplishment Plan Summary: Research information is required to elucidate exposure-effects relationships between pollutants and human health in order to develop a data base for determining: (1) Whether restricting exposure to particular pollutants is warranted to protect health; and, (2) If so, to what degree exposure should be restricted. For example, in the case of sulfates, nitrates, and respirable suspended particulates, information is available which indicates that restricting their exposures may be necessary. The essential questions concerning these pollutants then relates to the degree of control required. In the case of other pollutants such as organics, the most basic questions involve identifying whether they have an exposure-effects relation to health. Once an indication is available that they may require control, questions similar to those posed for sulfates, nitrates, and respirable suspended particulates must be addressed.

Laboratory Assignment: Health Effects Research Laboratory, Research Triangle Park

Multi-Route Exposures and Their Effects: Identification of the Health Effects of Non-Pesticide Organic and Inorganic Substances Commonly Reaching Man by Multiple Routes of Exposure — 601E

Extramural Funds: $376,000

Accomplishment Plan Summary: In order to protect human health adequately from pollutants through the variety of legal mechanisms available to EPA, research is needed which will permit assessments of total exposure and total body burden and their associated health effects. This Accomplishment Plan is directed toward discerning exposure-effects relationships between health and certain non-pesticide environmental contaminants which typically reach man by multiple routes of exposure. In addition, populations-at-risk to high exposure and response end-points appropriate to use in health effects studies are identified. Pollutants under investigation include vinyl chloride and lead, cadmium, copper, and other metals.

Laboratory Assignment: Health Effects Research Laboratory, Cincinnati
Health Effects Research Laboratory, Research Triangle Park

Air Exposures and Their Effects: Assessment of the Contribution of Environmental Carcinogens to Cancer Incidence in the General Population — 601F

Extramural Funds: $200,000

Accomplishment Plan Summary: The basic objective of this effort is to provide EPA with a systematic program which can provide an assessment of the contribution of environmental carcinogens to the incidence of cancer in the general population. Since a cancer mortality data base already exists in the National Cancer Institute and cancer incidence data may be obtainable, the principal initial thrust of this program will be to identify the significance of environmental carcinogens to human cancer incidence via an assessment of media transport, inter- and intra-media transformation, measurement methodology, exposure levels, dose assessment, and retrospective estimation of exposure, all conducted under a rigorous quality assurance program, for both anthropogenic and natural carcinogens which may affect the general population. After this initial phase the coordinated data base and system program will generate a requirement for targeted epidemiological and toxicologic studies. The results of this program will be a system to provide an early warning mechanism for hazardous materials. The data output from such a system will ultimately provide a firm basis on which to base effluent standards for carcinogenic materials which may be dispersed in the environment in any of the media. The program will consolidate the many data bases which currently exist in EPA and other agencies for use as the foundation for assessing the impacts of existing and future environmental agents on human carcinogens. In addition to the coordination of data bases, all ongoing programs within EPA and all those in other agencies that have a bearing on this program will be used, where appropriate, so that duplication of programs will not occur.

Laboratory Assignment: Environmental Sciences Research Laboratory, Research Triangle Park
Environmental Monitoring and Support Laboratory, Las Vegas

Air Exposures and Their Effects: Assessment of the Contribution of Environmental Carcinogens to Cancer Incidence in the General Population — 601F

Extramural Funds: $240,000

Accomplishment Plan Summary: The purpose of these studies is to identify candidate compounds or categories of compounds for carcinogenicity assessment in mammalian and in vitro test systems. Using available vital statistics, populations with increased cancer incidence will be identified and further studied to delineate specific neoplasm type and relevant demographic factors. These cancer incidence data will then be related to known or suspected chemical carcinogens, determined by environmental monitoring and emissions inventories, which are most likely due to the specific industrial composition of the study area. These environmental factors and health parameters will be correlated to accomplish the objective of this program.

Laboratory Assignment: Health Effects Research Laboratory, Research Triangle Park

Air Exposure and Their Effects: Assessment of the Contribution of Environmental Carcinogens to Cancer Incidence in the General Population — 601F

Extramural Funds: $100,000

Accomplishment Plan Summary: In order to determine the valid experimental model from which to predict toxic effects to man from experimental animals, it is necessary to conduct comparative metabolism studies in several species, including the sub-human primate, and to compare these compounds to man's metabolites. The objectives of this Accomplishment Plan are (1) to expand toxicologic studies to fill gaps in the available data base on carcinogens and co-carcinogens and to develop testing models to determine causal relationships, and (2) to develop screening test systems for use in predicting human carcinogenesis.

Laboratory Assignment: Health Effects Research Laboratory, Cincinnati

Preparation of Criteria Documents and Other Scientific and Technical Assessment Reports — 601G

Extramural Funds: $534,000

Accomplishment Plan Summary: The objective of this Accomplishment Plan is the preparation and ultimate publication of: Air Quality Criteria Documents, Scientific and Technical Assessment Documents, and summary documents as required by the Agency through the Director, Health Effects Research Laboratory, Research Triangle Park, North Carolina.

Laboratory Assignment: Health Effects Research Laboratory, Research Triangle Park

Water Exposures and Their Effects: Pollutants Posing a Health Risk Related to Water Quality Directly or Indirectly — 607A

Extramural Funds: $1,574,000

Accomplishment Plan Summary: Determine direct and indirect health effects resulting from the treatment and disposal of wastewater and sludge. To include: (1) The determination of health effects associated with land treatment and disposal of wastewater and sludge and develop the necessary criteria for the safe implementation of such practices; (2) The development of necessary health effects information to assure that the public is safe from pollutants emitted during operation of wastewater treatment plants; and (3) Three related projects to quantify health effects associated with the direct disposal of wastewater and sludge into the aquatic environment, associate the health effects with some index of the quality of the water (development of marine and fresh recreational water and shellfish-growing area criteria) and provide the biological inputs to translate the criteria into effluent guidelines and "siting" requirements for outfalls and sludge disposal. The project to study the fate of microbial indicators and pathogens in the marine environment (translation of criteria into effluent guidelines) is a joint EPA-NOAA program in which each agency will contribute to the required funding.

Laboratory Assignment: Health Effects Research Laboratory, Cincinnati

Multi-Route Exposures and Their Effects: Determination of the Health Implication of Substances Used as Pesticides — 615A

Extramural Funds: $921,000

Accomplishment Plan Summary: This Accomplishment Plan covers the health effects research data needed by the Office of Pesticide Programs (OPP) in meeting their legally mandated responsibilities in pesticides, including registration, label reviews, hazard classification, and tolerance setting. OPP has placed particular emphasis in review studies including the Reregistration Process and Rebuttable Presumption Against Registration Program. Most of the health effects data needed by OPP is provided by the registrants. However, supplementary data and missing information as well as checks to establish the validity of registrant-provided information are supplied by the Office of Research and Development (ORD). The ORD also provides, under this plan, for development of new and improved methods of toxicity testing.

Laboratory Assignment: Health Effects Research Laboratory, Research Triangle Park

Health Effects of Substitute Pesticide Chemicals — 615F

Extramural Funds: $1,250,000

Accomplishment Plan Summary: The Substitute Chemical Program covered under this Accomplishment Plan refers to the toxicity assessment of those chemicals which are under consideration by the Agency to replace those pesticides which are banned or removed from the market. In addition to thoroughly reviewing the literature on candidate biocides, research is focused on gap areas in the health effects data base with special emphasis on properties relating to carcinogenicity, neurotoxicity, teratogenicity, mutagenicity, inhalation exposure, immune response and endocrine effects.

Laboratory Assignment: Health Effects Research Laboratory, Research Triangle Park

Criteria Development and Special Studies — 630C

Extramural Funds: $775,000

Accomplishment Plan Summary: Prepare multi-media documents assessing the scientific and technical information available that will assist EPA to regulate environmental pollutants and determine the research status thereof, carry out special studies to advance the methodology available for determining the optimum levels for setting pollution control standards and the benefits of pollution control.

Laboratory Assignment: Office of Health and Ecological Effects, Headquarters

Multi-Route Exposures and Their Effects: Identification of Adverse Health Effects Due to Exposure to Toxic Substances — 629A

Extramural Funds: $613,000

Accomplishment Plan Summary: The objectives of the toxic substances research are: (1) to delineate the potential hazards to human health of environmental pollutants; (2) to develop methods by which various classes of toxic substances can be rapidly screened for specific biological activity potentially hazardous to human health; (3) to provide rapid, sensitive, and unambiguous biochemical parameters by which a quantitative assessment of exposure level can be made on human populations; (4) by utilizing fundamental physical constants and molecular structure develop methods by which persistence and disposition of toxic substances as well as biological activity can be predicted.

Laboratory Assignment: Health Effects Research Laboratory, Research Triangle Park

HEALTH AND ECOLOGICAL EFFECTS PROGRAM AREA
ECOLOGICAL PROCESSES AND EFFECTS SUBPROGRAM

Ecological processes and effects research is directed toward determining the effects of air, water and terrestrial pollutants on the structure and function of the ecosystems and on biotic and abiotic subcomponents of these ecosystems. The research effort is planned and organized along specific problem area lines; work is directed toward target media and conducted according to the character of the problem. Media are divided into freshwater, marine and terrestrial components.

Air Pollutant Effects Upon Terrestrial Ecosystems — 602A

Extramural Funds: $621,000

Accomplishment Plan Summary: The objective is to determine the effects of air pollutants, singly and in combination, in various concentrations, upon individual floral and faunal ecosystems components and upon intact ecosystems. The resultant information will be suitable to develop a scientific basis for air pollution control strategies and to establish secondary air quality standards in compliance with the Clean Air Act.

Laboratory Assignment: Environmental Research Laboratory, Corvallis

Freshwater Ecological Processes and Effects — 608A

Extramural Funds: $2,210,000

Accomplishment Plan Summary: In order for the Agency to issue quality criteria for water and to publish proposed effluent standards as mandated by the Federal Water Pollution Control Act (P.L. 92–500), information is required in four major areas: (1) the effects of specific pollutants and pollutant combinations on representative or key sensitive organisms in freshwater ecosystems; (2) the effects of specific pollutants and pollutant combinations on ecosystems-level parameters and processes which are dependent on particular functional groupings of organisms rather than on any particular species; (3) the physical, chemical, and biochemical transformation of pollutants which result from their introduction to or passage through freshwater ecosystems; and (4) environmental requirements and limits for freshwater organisms. Inherent in all of the above is the consideration, where applicable, of intermedia transport and effects.

Additional research includes the characterization of natural and stressed freshwater ecosystems; development of mathematical ecosystem simulations and laboratory models which aid in the prediction of pollutant stress effects on aquatic biota and ecosystems; and development of methods for assessing the socio-economic impact of pollutants on aquatic ecosystems.

Laboratory Assignment: Environmental Research Laboratory, Corvallis
Environmental Research Laboratory, Duluth

Marine and Estuarine Ecological Processes and Effects — 608C

Extramural Funds: $1,613,000

Accomplishment Plan Summary: In order for the Agency to develop water quality criteria for marine and estuarine waters, as well as provide information for use in developing effective pollution control programs, certain ecological information is required. The information required includes: (1) the effects of a pollutant or pollutant combinations on selected representative organisms; (2) the effect of a pollutant or pollutant combinations on ecosystem level parameters; (3) methods to measure the relative "health" of an ecosystem; (4) the knowledge of routes and rates of pollutant movement through the ecosystem, including routes to man; and (5) ecological requirements for marine organisms. While it is recognized that intermedia effects occur, this research provides data and evaluation methods regarding toxicity, distribution and degradation of pollutants, singly and in combination, in marine and estuarine systems.

Laboratory Assignment: Environmental Research Laboratory, Narragansett
Environmental Research Laboratory, Corvallis
Environmental Research Laboratory, Gulf Breeze

Marine and Estuarine Ecological Processes and Effects — 608C

Extramural Funds: $75,000

Accomplishment Plan Summary: This program is designed to obtain the biological inputs (parameters) to transport models so that health effects and target area criteria (such as recreational waters and shellfish-growing areas) can be translated into guidelines and standards for the disposal of wastewater and sludge into the marine environment. The transport models, with the added biological inputs, then could be used at a given sewage treatment plant to determine the required treatment and disinfection and placement of effluent outfalls and sludge dump sites to meet the target area guidelines.

This program to study the fate of microbial indicators and pathogens in the marine environment will be even more critical if, as proposed, EPA relaxes the requirement for universal disinfection of and the microbial standards for STP effluents.

Laboratory Assignment: Health Effects Research Laboratory, Cincinnati

Preparation of REEP/STARS — 616A

Extramural Funds: $205,000

Accomplishment Plan Summary: This program is designed to develop the capability to prepare high quality documents (scientific and technical assessment reports i.e., STARS). This program will review and assess multimedia health and environmental effects of pollutants and is, in part, a continuation of an already existing program. A system for identifying and ranking pollutants with regard to potential environmental hazard will be developed.

Laboratory Assignment: Health Effects Research Laboratory, Cincinnati

Fate and Effects of Synthetic Organic Compounds on Aquatic Ecosystems — 714A

Accomplishment Plan Summary: In order to establish water quality criteria for pesticides as mandated by the Federal Water Pollution Control Act and subsequent legislation, certain ecological information is required. The information required includes: (1) the effects of pesticides or pesticide combinations on selected representative sensitive organisms; (2) the effect of pesticides or pesticide combinations
on ecosystem level parameters; (3) the knowledge of routes and rates of pesticide movement through the ecosystem, including routes to man; (4) the fate of pesticides in estuarine ecosystems; and (5) the frequency and significance of carcinogens and viruses in the estuarine and marine environments.

Laboratory Assignment: Environmental Research Laboratory, Gulf Breeze
Environmental Research Laboratory, Duluth

Ecological Effects of Substitute Pesticide Chemicals — 714B

Extramural Funds: $324,000

Accomplishment Plan Summary: To develop, validate, and utilize suitable methods and techniques of assessing deleterious and/or beneficial ecological effects of designated candidate substitute pesticide chemicals when they may be used or transported to any or all of the following ecosystems: terrestrial, estuarine/marine, freshwater. Transport within the environment of the substitute pesticide or its degradation components, its bio-accumulation synergism, and other pertinent ecological properties will be appropriately evaluated within the context of its likely designated use or which will result from its environmental mobility.

Laboratory Assignment: Environmental Research Laboratory, Gulf Breeze
Environmental Research Laboratory, Duluth
Environmental Research Laboratory, Corvallis

Development and Characterization of Laboratory Model Ecosystems for Evaluating Toxic Substances Fate and Effects — 715B

Extramural Funds: $250,000

Accomplishment Plan Summary: Characterize existing model ecosystems and microcosms (not necessarily complete ecosystems) as to replicability, effect of size and structure, applicability of results to real-world ecosystems, suitability for criteria development, and as screening tools for toxic contaminants.

Develop and characterize new model ecosystems and microcosms capable of simulating a range of key ecosystem-level processes and parameters, and suitable for evaluating important major categories of ecological stressing factors.

Use model ecosystems/microcosms to screen toxic contaminants and to provide ecosystem level criteria data on specific environmental stressing factors.

Laboratory Assignment: Environmental Research Laboratory, Athens

HEALTH AND ECOLOGICAL EFFECTS PROGRAM AREA
TRANSPORT AND FATE OF POLLUTANTS SUBPROGRAM

The transport and fate research is directed toward the development of empirical and analytical techniques that relate air pollution source emissions to ambient exposures. This requires research in the area of (a) atmospheric processes and effects for the determination of air pollutant sources, sinks, transport and transformation of airborne gaseous and particulate matter; and the effects of air pollutants on visibility, rainfall, and climate and (b) air pollutant characterization and measurement for the development of new and/or improved methodology and instrumentation technology for the characterization and quantification of air pollutants from stationary mobile sources and in the ambient air. A similar problem area exists for the transport and fate of pollutants entering the aquatic environment.

Atmospheric Processes and Effects — 603A

Extramural Funds: $7,931,000

Accomplishment Plan Summary: Studies on atmospheric processes and effects will be conducted to determine qualitatively and quantitatively the sources and sinks, kinetics of formation and removal, and chemical/physical interactions of airborne gaseous and particulate matter. This area of research covers: (1) The development, evaluation, and validation of air quality simulation models for predicting and describing air quality impacts anticipated from various control abatement strategies; (2) Determination of atmospheric chemical and physical processes for describing the formation and decay of gaseous and particulate air pollutants; and (3) Quantification of the atmospheric effects on visibility, acid rainfall, and climate due to air pollutant and thermal emissions.

Laboratory Assignment: Environmental Sciences Research Laboratory, Research Triangle Park

Sources, Processes, and Systems — 609A

Extramural Funds: $1,292,000

Accomplishment Plan Summary: The overall objective of this Accomplishment Plan is to provide the scientific understanding, methodologies, and associated data bases required to: (1) evaluate and predict the transport, transformations and fate of trace organics and inorganic pollutants entering freshwater ecosystems; (2) predict water quality impacts resulting from the discharge of point and non-point source pollution into fresh surface waters; and (3) evaluate the relative cost-effectiveness of alternative basin-wide point and non-point source pollution control strategies. This technology will be used in the development of water quality criteria for toxic pollutants, evaluation of pesticides under consideration for registration, identification of the necessary point and non-point source control requirements under the Federal Water Pollution Control Act and similar water quality management planning efforts, and determination of appropriate effluent limitations to be imposed through the permit program in water quality limited stream segments.

Laboratory Assignment: Environmental Research Laboratory, Athens

ENERGY PROGRAM AREA

The Energy Program Area is fundamental to EPA's responsibility to protect the public health and welfare from the adverse effects of pollutants discharged by or associated with energy systems. Such protection must be accomplished through a multimedia approach so that the control of one form of pollution does not result in an unacceptable impact occurring in another media. Because of the potentially acute health and ecological effects associated with the traditional, as well as the new technologies for fuel extraction, processing, and conversion, the EPA has a major responsibility in this area to ensure that environmental quality and human health are protected. Further, since many of the problems are long-term, e.g., many technologies will not be available and in commercial use before early 1985, the EPA must have programs underway now to develop the health and technical data base necessary to support future New Source Performance Standards and Ambient Air Quality Standards.

The Energy Program Area is organized into three subprograms: Extraction and Processing Technology; Conservation, Utilization and Technology Assessment; and Health and Ecological Effects.

EXTRACTION AND PROCESSING TECHNOLOGY SUBPROGRAM

The Extraction and Processing Technology Subprogram includes the assessment of problems and development of control techniques to mitigate the environmental impact of the extraction of energy resources. Solid, liquid and gaseous fuels as well as advanced energy sources, such as uranium and geothermal energy, are considered. Extraction problems cover a wide spectrum of activities from the development of techniques to abate acid mine drainage, to the restoration of strip-mined land in humid and dry areas, to the assessment of the socio-economic impacts of mining a virgin area, to the assessment of practices on off-shore oil rigs. Also included is a program which provides environmental control technology and environmental assessments of important fuel processing schemes, including low and high-BTU gasification, liquification, coal cleaning, shale oil processing, and fluidized bed combustion.

Energy Control Technology: Fuel Processing — 623A

Extramural Funds: $13,264,000

Accomplishment Plan Summary: The Fuel Processing Program will promote and participate in the development of advanced technologies for fuel processing by providing environmental technology development and environmental assessment. Processes for physical/chemical coal cleaning are being developed with the support of the Bureau of Mines, the Geological Survey, and the Energy Research and Development Administration. Environmental support is being given to the National Fluidized Bed Combustion Program. In synthetic fuels and oil shale, the program is identifying and quantifying the discharges from processes under development and evaluating and developing control technology. The chemically active fluid bed process for residual oil cleaning is being demonstrated at a utility. Studies are underway to reduce environmental impacts from parts of the nuclear fuel cycle other than mining and milling. Physical coal cleaning to meet sulfur standards is being demonstrated at an electrical utility.

Laboratory Assignment: Industrial Environmental Research Laboratory, Research Triangle Park

Energy Control Technology—Fuel Processing (Oil Shale and Synthetic Fuels From Non-Coal Sources and Nuclear Energy Systems) — 623A

Extramural Funds: $578,300

Accomplishment Plan Summary: The Fuel Processing program will promote and participate in the development of advanced technologies for fuel processing by providing environmental technology development and environmental assessment. In synthetic fuels and oil shale, the program is identifying and quantifying the discharges from processes under development and evaluating control technology. Characterization of the multi-media pollution problems associated with synthetic fuel processing and utilization will be accomplished. This program is being coordinated closely with the oil shale extraction and handling program and with the synthetic fuels program. In the nuclear area, studies are underway by the Office of Radiation Programs to reduce environmental impacts from parts of the nuclear fuel cycle other than mining and milling.

Laboratory Assignment: Industrial Environmental Research Laboratory, Cincinnati

Energy Resource Extraction and Handling: Solid Fossil Fuels — 623B

Extramural Funds: $2,713,100

Accomplishment Plan Summary: As mandated under the Water, Air, and Solid Waste Acts, it is the intent of this Accomplishment Plan to develop and prove new pollution control technology for production of solid fossil fuels. Work will be undertaken to assess the potential environmental damages (air, water, noise, etc.), from active and abandoned mining transportation and benefication processes; to develop methods to control, treat and abate environmental pollutants from these operations; to demonstrate and document the technical/operational feasibility and cost/effectiveness of environmental control options; to provide on a timely basis environmental control information; and to prepare manuals of practice which encompass all environmental pollution control aspects in a form that meets the operational needs of both regulatory/control agencies and industry.

Laboratory Assignment: Industrial Environmental Research Laboratory, Cincinnati

Energy Resource Extraction: Oil and Gas Production — 623C

Extramural Funds: $1,714,900

Accomplishment Plan Summary: Assess the existing and potential adverse environmental impacts (air, water, land) from active and planned oil and gas production, storage and transportation facilities; develop methods, technology and equipment to prevent, control and abate environmental pollutants from these operations; demonstrate and document the technical/operational feasibility and cost/effectiveness of environmental control options; provide on a timely basis environmental control guidelines; provide standardized manuals of practice which encompass all environmental pollution control aspects in a format that meets the operational needs of the industry; and provide technical reports describing the environmental control options available for practice in a manual suitable for regulatory/control agency use and industrial planning/design use.

Laboratory Assignment: Industrial Environmental Research Laboratory, Cincinnati

Environmental Assessment Interface and Research Studies — 623D

Extramural Funds: $120,000

Accomplishment Plan Summary: The goal of the Environmental Assessment Program is to determine, in the case where a single system or process is being assessed, whether the system/process is environmentally acceptable or whether further or more economical control of waste streams is necessary. If further control is considered necessary, the assessment estimates how much control is needed and what waste stream components are especially important to control. In cases where comparative assessments are being made of two or more systems or processes, an additional goal may be to determine which one(s) are environmentally preferable.

The overall objective of this Accomplishment Plan is to provide the Office of Energy, Minerals and Industry Environmental Assessment Program necessary consultation, data, and research information in the development, use, and interpretation of: (1) decision criteria; (2) impact factors; and (3) bio-assays.

Laboratory Assignment: Environmental Research Laboratory, Narragansett
Environmental Research Laboratory, Corvallis
Environmental Research Laboratory, Gulf Breeze
Health Effects Research Laboratory, Cincinnati
Health Effects Research Laboratory, Research Triangle Park

ENERGY PROGRAM AREA
CONSERVATION, UTILIZATION AND TECHNOLOGY ASSESSMENTS SUBPROGRAM

The Conservation, Utilization and Technology Assessments Subprogram includes three distinct parts — conservation, utilization (electrical energy production) and technology assessments.

The conservation portion of the Subprogram will provide environmental assessments and contribute to the development of environmentally compatible advanced technologies and control technologies for waste recovery, indoor air quality, and second generation energy systems, e.g., solar and geothermal energy.

The utilization portion of this subprogram includes the identification, characterization, assessment and development, where appropriate, of control technology for pollutants associated with electric utility and industrial combustion sources. A multi-media approach is planned with gaseous, liquid and solid wastes considered. Both primary pollutants (effluents from uncontrolled combustion systems) and secondary residuals (effluents from control technology) must be carefully considered. Emphasis is focused on generating information which can be used to help set environmental standards and guidelines and develop economical control technology so that such standards can be achieved.

The objective of the integrated assessment portion of this subprogram is the identification of environmentally, socially and economically acceptable alternatives for meeting National energy supply objectives, and assistance in the selection of optimum policies for the attainment of associated environmental quality goals.

Utility and Industrial Power – 624A

Extramural Funds: $18,510,000

Accomplishment Plan Summary: The overall objective of this Accomplishment Plan is the identification, characterization, assessment and development, where appropriate, of control technology for pollutants associated with utility and industrial combustion sources. It is important that a multi-media approach be taken with gaseous, liquid, and solid wastes carefully investigated in terms of a balanced and comprehensive control plan. Both primary pollutants (effluents from uncontrolled combustion systems) and secondary residuals (effluents from controlled technology) must be carefully considered. Emphasis must be focused on generating information which will be useful in the preparation of environmental standards and guidelines and developing economical control technology so that such standards can be achieved.

Laboratory Assignment: Industrial Environmental Research Laboratory, Research Triangle Park

Utility and Industrial Power/Control of Waste and Water Pollution — 624A

Extramural Funds: $200,000

Accomplishment Plan Summary: Conduct specific projects as part of the EPA program to control waste and water pollution from utility and industrial flue gas cleaning systems. The objectives of these projects are as follows: (1) Determine the extent to which the migration of chemicals from flue gas cleaning wastes can be attenuated by soils in land disposal sites and develop an empirical method to describe the migration potential; (2) Determine the compatibility of various liner materials when exposed to flue gas cleaning wastes; (3) Determine the leachability and durability of products from first generation flue gas cleaning waste treatment processes; conduct a field evaluation of current flue gas cleaning waste disposal technology; and assess, screen, and demonstrate (on a pilot scale) second generation flue gas cleaning waste treatment processes; and

(4) Establish the data base for the future development of standards for the disposal of flue gas cleaning wastes and identify research and development needs for standards development. Management and results of these projects will be coordinated with other projects in the EPA waste and water program.

Laboratory Assignment: Municipal Environmental Research Laboratory, Cincinnati

Wastes-As-Fuel — 624B

Extramural Funds: $825,000

Accomplishment Plan Summary: Assess, develop and evaluate equipment and systems for processing wastes for preparing fuels and feedstocks for energy recovery via all conversion processes, and for converting wastes to fuels via biological conversion processes. Analyses will determine the optimal composition of waste inputs, energy balances, materials balances, emissions and residuals, effectiveness of emission controls and residue handling systems, needs for new types of pollutant control equipment, life-cycle costs, economic viability, theory, and other aspects. Major technologies and methods will be explored for fuel and feedstocks recovery and for bio-conversion. For full feedstock processes under development by the Municipal Environmental Research Laboratory, technical assistance, pollutant assessment, criteria sampling and analysis, and the performance of pollutant characterizations will be conducted.

Laboratory Assignment: Municipal Environmental Research Laboratory, Cincinnati

Environmental Aspects of Energy Conservation Methods and Advanced Energy Systems — 624B

Extramural Funds: $4,411,100

Accomplishment Plan Summary: This Accomplishment Plan will provide environmental assessments and contribute to the development of environmentally compatible advanced technologies and pollution control technologies for waste recovery, indoor air quality, energy-conserving industrial processes, advanced energy conversion cycles, and advanced energy systems (solar, geothermal energy, etc.). Techniques and technologies are under development by the Energy Research and Development Administration, Federal Energy Administration, Housing and Urban Development, and other agencies in each of these areas and by the EPA in the resource recovery area. Environmental and some process development support are provided under this EPA program. Outputs from this program will support EPA's role on two interagency working groups, the Interagency Task Force on Energy Conservation in Buildings and the Interagency Task Force on Energy Conservation in Industry, as well as EPA regulatory responsibilities by assuring the environmental compatibility of techniques and technologies in each energy area.

Laboratory Assignment: Industrial Environmental Research Laboratory, Research Triangle Park
Industrial Environmental Research Laboratory, Cincinnati

Geothermal Environmental Impact Assessment — 624B

Extramural Funds: $150,000

Accomplishment Plan Summary: The objective of this effort is to assess the actual and potential environmental impacts of existing and potential geothermal energy resource exploitation. Program emphasis is on groundwater contamination. Coordination with the Energy Research and Development Administration is essential. Studies should identify pollutants, pathways into the underground water environment, ecological hazards associated with long term operating facilities and design a monitoring system applicable to any geothermal resource development and conversion facility. Initial focus should be on The Geysers, Imperial Valley and Klamath Falls, Rio Grande Rift Zone and include: produced fluids, disposal methods, subsidence possibilities, seismic effects, thermal losses, groundwater pollution, fluids radioactivity, non-condensates requiring monitoring, condensates requiring monitoring, food chain uptake of geothermally associated pollutants. Projects should be coordinated closely with the Industrial Environmental Research Laboratory, Cincinnati, and data produced should support the development of effluent guidelines and other environmental regulations for geothermal systems.

Laboratory Assignment: Environmental Monitoring and Support Laboratory, Las Vegas

Energy-Integrated Assessment — 624C

Extramural Funds: $1,750,000

Accomplishment Plan Summary: The overall objective of this Accomplishment Plan is the identification of environmentally, socially, and economically acceptable alternatives for meeting national energy supply objectives, and to assist in the selection of "optimum" policies for the attainment of associated environmental quality goals. This objective will be met by: (1) Integrating the results of the environmental research program with the remainder of the Energy Research Program; (2) Evaluating the cost/risk/benefit trade-offs of energy production and pollution control alternatives; (3) Conducting technology assessments which evaluate alternative energy technologies and approaches for implementing energy development, preventing environmental damage, and securing related benefits; and (4) Identifying gaps in present research programs and indicating new priority research topics which must be addressed in order to support direct Agency responsibilities.

Laboratory Assignment: Office of Energy, Minerals and Industry, Headquarters

Energy Integrated Assessment (SEAS Program)

Extramural Funds: $140,000

Accomplishment Plan Summary: A series of efforts designed to keep the Strategic Environmental Assessment System in a state of maximum usefulness by continuously updating SEAS data files, revising, and updating the basic system when improvements become available, and revising SEAS module algorithms to increase its energy assessment capabilities. In addition, this project provides for application of SEAS to support Agency response to Congressional requests and other small scale analyses, as well as major support of technology assessments.

Laboratory Assignment: Office of Monitoring and Technical Support, Headquarters

ENERGY PROGRAM AREA
HEALTH AND ECOLOGICAL EFFECTS SUBPROGRAM

The Health and Ecological Effects Subprogram encompasses a program to determine the environmental effects associated with energy extraction, transmission, conversion and use so that measures can be taken in a timely manner to protect human health, the ecosystem, and social goals. Identification of the pollutants released by energy-related industrial operations and determination of their impact on the human and natural environment will define the environmental control requirements for the polluting operations. Included are studies to characterize the risks, costs or benefits associated with development and utilization of energy technology to human health and welfare and to environmental quality and ecological systems.

Effects of Energy Related Pollutants on Organisms and Ecosystems — 625A

Extramural Funds: $3,389,000

Accomplishment Plan Summary: Determine acute and chronic toxicological effects on freshwater, marine/estuarine and terrestrial organisms and resultant ecosystem impacts from single pollutants and combinations of pollutants released from energy extraction, conversion, transmission and use. Develop requisite baseline information and develop and assess methodology and techniques for reclamation of areas impacted by energy resource development.

Laboratory Assignment: Environmental Research Laboratory, Gulf Breeze
Environmental Research Laboratory, Corvallis
Environmental Research Laboratory, Duluth
Environmental Research Laboratory, Narragansett

Transport and Fate of Energy-Related Pollutants in Ecosystems — 625B

Extramural Funds: $2,089,000

Accomplishment Plan Summary: Determine the origins, loads, transport pathways, transfer rates and fates in the atmosphere, and fresh surface and groundwaters of single pollutants and combinations of pollutants associated with energy extraction, conversion, transmission and utilization.
Develop and test predictive models for determining the transport and fate of energy-related pollutants.

Laboratory Assignment: Environmental Sciences Research Laboratory, Research Triangle Park
Robert S. Kerr Environmental Research Laboratory, Ada
Environmental Research Laboratory, Athens

Energy Related Pollutant and Effects Monitoring and Associated Methods and Techniques Development — 625C

Extramural Funds: $1,501,000

Accomplishment Plan Summary: The overall objective of this program is to provide validated environmental quality baseline data in those geographical areas where the impact of new energy development is or is projected to be of major magnitude on the environment. The output is to be a geographically broad environmental overview which focuses on the regional and local impact of major energy development.

This program is to provide a scientifically valid reference point from which future environmental degradation may be measured and upon which rational policy decisions may be made (e.g., classification of areas regarding non-significant deterioration amendments to the Clean Air Act). These decisions will concern both future environmental standards and the direction and magnitude of specific energy development (e.g., strip mining legislation). This program includes the development of new and advanced monitoring methods and techniques needed to provide data and information of broad scope in support of the main purpose of the energy program.

Laboratory Assignment: Environmental Monitoring and Support Laboratory, Cincinnati
Environmental Monitoring and Support Laboratory, Las Vegas
Environmental Monitoring and Support Laboratory, Research Triangle Park

Energy Related Pollutant Measurement and Instrumentation Development — 625D

Extramural Funds: $520,000

Accomplishment Plan Summary: The objective of this Accomplishment Plan is the development of methods and instrumentation for the measurement of energy-related pollutants and the performance of special field studies and analyses related to characterizing the levels of certain pollutants injected into the environment by new technologies and energy developments at specific geographical sites.

Laboratory Assignment: Environmental Sciences Research Laboratory, Research Triangle Park
Environmental Research Laboratory, Athens

Air, Water, and Multi-Route Exposures and Health Effects From Pollutants Associated With Energy Development — 625F

Extramural Funds: $1,030,000

Accomplishment Plan Summary: Studies have been designed to assess the health effects of exposures to substances which pollute air and water as a result of energy technologies. Emphasis is being placed on potentially toxic agents resulting from fuel extraction, conversion and combustion. The evaluation of the toxicity of the pollutants and their metabolic products includes a spectrum of bioeffect indices. The present program includes: (1) the assessment of exposure to toxic organic chemicals which are associated with energy processes and which reach man through water. The investigations include screening for potential carcinogens, mutagens, and teratogens in water supplies, as they result from energy sources emphasizing coal and shale oil processing; and (2) toxicologic data are obtained for multi-route exposures from metal pollutants resulting from fossil fuel extraction,

combustion and conservation. The establishment of additional physiological and biochemical indicators to establish a more sensitive dose-effect data base includes studies of age sensitivity and influence of dietary composition on absorption, deposition and toxicity of the trace elements which pollute the environment from energy-related sources; long-term effects of inhalation exposures to toxic components of fly ash; biochemical effects of energy-related trace metals on pulmonary macromolecular metabolism.

Laboratory Assignment: Health Effects Research Laboratory, Cincinnati

Air, Water, and Multi-Route Exposures and Health Effects From Pollutants Associated With Energy Development — 625F

Extramural Funds: $3,734,000

Accomplishment Plan Summary: Research emphasis is placed upon health effects from exposure to sulfates, particulates and organics. A diversified approach is made through in vitro as well as in vivo studies. Various species of animals (including non-human primates) and human subjects will be involved. In human studies both clinical and epidemiological approaches are used. Endpoints for consideration include carcinogenesis, toxicology, physiological parameters such as cardiovascular and pulmonary function, biological defense mechanism and biochemistry. Depending upon the discipline approach used, levels of pollutant exposure range from ambient (epidemiology) to concentrated (in vitro screening).

Laboratory Assignment: Health Effects Research Laboratory, Research Triangle Park

Air, Water, and Multi-Route Exposures and Health Effects From Pollutants Associated With Energy Development — 625F

Extramural Funds: $137,000

Accomplishment Plan Summary: Study the effects of pollutants associated with energy development. Assess hazards of human exposures to organic chemicals which reach man through bioconcentration in the food chain of the marine environment.

Laboratory Assignment: Environmental Research Laboratory, Gulf Breeze

Environmental Assessment Interface and Research Studies — 625G

Extramural Funds: $100,000

Accomplishment Plan Summary: The goal of the Environmental Assessment Program is to determine, in the case where a single system or process is being assessed, whether the system process is environmentally acceptable or whether further or more economical control of waste streams is necessary. If further control is considered necessary, the assessment estimates how much control is needed and what waste stream components are especially

important to control. In cases where comparative assessments are being made of two or more systems or processes, an additional goal may be to determine which one(s) are environmentally preferable.

The overall objective of the Accomplishment Plan is to provide the Office of Energy, Minerals and Industry's Environmental Assessment Program necessary consultation, data, and research information in the development, use, and interpretation of: (1) decision criteria; (2) impact factors; and (3) bio-assays.

Laboratory Assignment: Environmental Research Laboratory, Duluth

INDUSTRIAL PROCESSES PROGRAM AREA

A research program in the Industrial Processes Area is essential for the Agency to meet the requirements of the Clean Air Act, the Water Act and the Solid Waste legislation. By involvement in research in this area, systems are developed and transferred to industries which enable them to comply with abatement requirements. Information is developed for the detection, control and abatement of pollution from industrial and extractive processes, and land use. Another part of the program is concerned with identification and economic evaluation of present and alternate systems. This research program is comprised of two subprograms — the Minerals, Processing and Manufacturing Subprogram and the Renewable Resources Subprogram.

MINERALS, PROCESSING, AND MANUFACTURING SUBPROGRAM

The Minerals, Processing and Manufacturing Subprogram concerns point sources of water, air and residue pollution arising from the industrial sector of the economy and is focused on those mining, manufacturing, service and trade industries which are involved in the extraction, production and processing of materials into consumer products. In addition, the environmental problems resulting from the accidental spill of selected materials are also relevant. It is the purpose of this research activity to support the technology requirements of the Clean Air and Water Pollution Control Acts through the demonstration of new or improved technology having industry-wide applicability, short-term achievability and long-term viability.

Hazardous Material Incidents: (Air) 604A — (Water) 610A

Extramural Funds: $2,000,000

Accomplishment Plan Summary: The objectives of this Accomplishment Plan are to develop, evaluate and demonstrate new or improved equipment, devices and systems for the prevention, detection, identification, containment, control, removal, cleanup, recovery and disposal of spills or acute releases of hazardous pollution substances. The development of this hardware is to be carried out beyond the prototype stage to the point where it is ready for field implementation by the commercial community. Techniques are to be defined for the redevelopment and restoration of ecosystems that have been biologically damaged as a result of spills; to assess these damages, the ecological effects and persistency of high concentration, short duration slugs (non-continuous discharges) of hazardous substances on the environment are to be determined. Primary efforts are to be directed toward demonstration technologies to protect and minimize damages to the water, land and air milieu from sudden discharges of hazardous chemicals. A special category of this program will focus on research and development (R&D) technical assistance to Federal, state and local personnel for emergency spill response and for supervision of the use of newly developed R&D equipment during actual spill situations.

Laboratory Assignment: Industrial Environmental Research Laboratory, Cincinnati

Materials Processing: (Air) 604B — (Water) 610B

Extramural Funds: $4,637,200

Accomplishment Plan Summary: The problem area is discrete point sources of air, water and residue pollution arising from manufacturing and service industries primarily devoted to the processing of chemicals and other raw materials into intermediate and final products. Of special concern are toxic and hazardous pollutant control. The objective of the Accomplishment Plan is to develop technology necessary to eliminate the discharge/emission of all pollutants (primarily toxic pollutants) from materials processing industry point sources research activities culminating in the demonstration or assessment of engineering scale technologies. Deliverables are research findings which will be immediately translated into public/private sector use through reports, seminars, and Agency standards.

All research activities must have industry-wide applicability, technical and economic achievability for implementation, long-term viability, and must serve as a basis for establishing, improving or implementing required standards. The research can be classified as Open Cycle (OC), Closed Cycle (CC), Toxics Control Technology and Total Environmental Control (TEC). The decision as to which broad technology option has the highest priority for ORD focus is unique to each point source category and must (a) result from an assessment of the state-of-the-art control technology, (b) fit within the framework of the Agency's discharge/emission standards, and (c) include an evaluation of implementation achievability and viability.

Laboratory Assignment: Industrial Environmental Research Laboratory, Cincinnati
Industrial Environmental Research Laboratory, Research Triangle Park
Robert S. Kerr Environmental Research Laboratory, Ada

Materials Production: (Air) 604C — (Water) 610C

Extramural Funds: $2,786,000

Accomplishment Plan Summary: The problem area is point sources of pollution associated with the extraction (both active and abandoned mines) and processing of raw materials into intermediate products for consumption by the materials processing industries. Excluded from consideration is the extraction of fuels and processing of solid fuels. Toxic and hazardous pollutant control is of special concern.

The objective of the materials production research, development and demonstration program is to develop manuals of practice (MOPs best state-of-the-art) to prevent and/or to control environmental damage from the materials production industries. These MOPs will address the simultaneous control of air, water, and noise pollution and the environmentally acceptable recovery and utilization of industrial residues from all industry pollutant sources and will be in a form that meets the operational needs of both regulatory/enforcement agencies and industry. It is expected that MOPs representing various stages of technology development will be required for each priority industry to be considered. The goal of this program is to provide MOPs for all materials production industries by 1985.

Laboratory Assignment: Industrial Environmental Research Laboratory, Cincinnati
Industrial Environmental Research Laboratory, Research Triangle Park
Robert S. Kerr Environmental Research Laboratory, Ada

Areawide-Combined Industrial Point Sources — 610F

Extramural Funds: $275,000

Accomplishment Plan Summary: The problem area is point sources of pollution, industrial in nature, specifically those manufacturing, mining, electric and water service establishments which seek to manage their pollution problems on an areawide/combined basis with other point sources. The objective is to develop the totality of the means necessary to eliminate the discharge/emission of pollutants for the areawide/combined point source where industrial components predominate environmental management option. Outputs will be a spectrum of integrated research, development, and demonstration activities culminating in demonstration or assessments of engineering scale technologies. The activities will be translated for public and private sector use through technical reports, seminars, design guidelines, and Agency discharge standards.

The research shall be classified as Open Cycle (OC), Closed Cycle (CC), and Total Environmental Control (TEC) depending upon whether an interim discharge of pollutants is characteristic and whether point source control of air and solid waste problems is addressed. The research activities must have industry wide applicability, have technical and economic achievability for implementation, long-term viability, and serve as a basis for establishing, improving, and/or implementing the required discharge standards. The water standards sought, levels of control desired, and implied TR leadtime requirements are: (1) Best Available Control Technology Economically Achievable (BAT)—by January 1979; (2) Elimination of the discharge of pollutants—by 1984; (3) Elimination of multi-media pollution discharges—by 1984.

Laboratory Assignment: Robert S. Kerr Environmental Research Laboratory, Ada

INDUSTRIAL PROCESSES PROGRAM AREA
RENEWABLE RESOURCES SUBPROGRAM

The Renewable Resources Subprogram encompasses the development of total management systems, including predictive methodology, to control air, water and land pollution from the production and harvesting of food and fiber and their related residual wastes and assessment of probable trends in the production of renewable resources and their resulting environmental impact. Major activities include crops on both irrigated and non-irrigated lands, silviculture practices and animal production.

Irrigated Crop Production — 617A

Extramural Funds: $1,090,000

Accomplishment Plan Summary: The control of environmental degradation caused by irrigated crop production is a multifaceted problem involving technical, legal, economic, and institutional considerations. The objective of this program is to develop and demonstrate by bench, pilot plant and field scale studies the fundamental technology needed for full scale pollution control programs in irrigated areas. This technology includes: canal and lateral lining and other structural controls for water delivery systems; methods to minimize water use; increased water use efficiency; control of nutrient losses; salinity control; sediment control; leaching losses; pesticide transport in irrigated systems; and treatment processes. The evaluation of the legal, economic, and institutional constraints to water management reform and technology changes is required. Development and verification of mathematical simulation and predictive techniques based on physical-chemical-biological processes occurring in irrigated soil systems is required to assess the effects of on-farm water management practices on the water quality of receiving streams. These models can be used to develop technically sound alternative pollution control management schemes for irrigated systems. The alternatives will include waste stream treatment processes. The outputs would be used by Federal, state, and local planning and pollution control agencies for the assessment and control of pollutants resulting from irrigated crop production activities.

Laboratory Assignment: Robert S. Kerr Environmental Research Laboratory, Ada

Non-Irrigated Crop Production — 617B

Extramural Funds: $1,186,000

Accomplishment Plan Summary: Define and assess management practices available to preserve desirable environmental quality affected by non-irrigated agriculture. Develop engineering and management methods to preserve or restore desirable environmental quality. Determine whether different practices on different areas of a watershed may be necessary to abate pollution rising from varying climatic and edaphic conditions. Demonstrate and transfer this information to users. As part of this effort, develop mathematical predictive and simulative models for degradation and/or runoff of agricultural chemicals, sediment and oxidizable organics. Test, perfect and demonstrate these models to (1) predict impacts of agricultural practices on pollutant transport and thus on water quality, and (2) assess the effectiveness of alternative control/management methods. Evaluate cost-effectiveness of those control options and develop methods for estimating the economic and social impacts of pesticide regulation and chemical/sediment management systems. Exert influence upon and utilize the expertise of U.S. Department of Agriculture and other agencies, where appropriate, in achieving these goals.

The outputs should be completed in time to meet the 1983 requirements for best management practices and would be used by Federal, state, and local planning and pollution control agencies for the assessment and control of pollutants resulting from non-irrigated crop producing activities.

Laboratory Assignment: Environmental Research Laboratory, Athens

Forest Management — 617C

Extramural Funds: $300,000

Accomplishment Plan Summary: Methods to assess and control the adverse environmental effects of forestry watersheds activities will be defined, developed, and demonstrated. Assessment methodology includes predictive modeling and decision protocols to related: (1) watershed activities (including controls) to total environmental quality; (2) control systems to socio-economic impacts; (3) control systems to total forest and water resource management. Control methodology includes: (1) forest management and engineering technology designed to reduce pollutants generated primarily via runoff; and (2) land use constraints to enhance environmental quality. Control systems and their optimum application through assessment methodology are demonstrative of the "best management practices" needed to satisfy the 1983 water quality goals.

These tools are needed by the State and local planner/decision makers to determine the water and land pollution impacts from forestry practices, establish water quality criteria and to develop management practices appropriate to local conditions.

Laboratory Assignment: Environmental Research Laboratory, Athens

Animal Production — 617D

Extramural Funds: $748,000

Accomplishment Plan Summary: The major problem confronting the Agency in the area of animal production, including both animals and poultry, is that of providing the management tools to dispose of animal wastes in an environmentally safe manner. Currently the most economically feasible means of disposing of wastes from the majority of animal production units is by means of land application. Land application may not, in all cases, be environmentally feasible; therefore, application techniques must be evaluated and guidelines suggested for all regions of the Nation. Continued animal production in areas where land application is not feasible is dependent on the utilization of waste disposal methods other than land application. The program will evaluate these systems, characterize their waste streams, and propose possible means of disposal along with an evaluation of the effectiveness of each system. For those animal production units not now under any permit system, guidelines must be suggested for alternative pollution management systems. The majority of animals in the Nation are produced under non-feedlot conditions and therefore represent a distinctive non-point pollution source. Pollution potentials from these conditions must be evaluated and control/management

systems must be developed. The animal production industry is one of constant change and certain of these changes will impact the environmental acceptability of present management systems. Changes in production systems will be evaluated by the program to safeguard against potential adverse environmental consequences. New pollution control management systems will be suggested and evaluated to correspond with industry changes.

Laboratory Assignment: Robert S. Kerr Environmental Research Laboratory, Ada

Alternate Pest Management Systems — 617E

Extramural Funds: $1,400,000

Accomplishment Plan Summary: The objective of this Accomplishment Plan is to provide the necessary basis for development of strategies and tactics of insect pest control for major pesticides using crop ecosystems which will permit marked reduction or virtual elimination of dependence on pesticide chemicals as a regular agricultural pest management practice. Concomitantly, a similar but a lesser effort will be devoted to development of scientific basis for control strategies for urban pests. While present emphasis is only on insect control, a gradual shift of a portion of the effort toward pest-plant control is contemplated for the intermediate out years, i.e., FY 79–80.

Laboratory Assignment: Office of Health and Ecological Effects, Headquarters

PUBLIC SECTOR ACTIVITIES PROGRAM AREA

This area contains many subprograms that are fundamental to EPA's responsibilities. These subprograms have been combined into a single program area, Public Sector Activities, because they are inter-related and also require many of the same skills and equipment development. This research program focuses on pollution problems resulting from community, residential or other non-industrial activities; health effects resulting from contaminated drinking water supplies; water treatment systems management and ground water management; and land use management studies. This program has three components — Waste Management, Water Supply, and Environmental Management.

WASTE MANAGEMENT

The Waste Management Subprogram includes prevention, control, treatment and management of pollution resulting from community, residential or other non-industrial activities. Technical areas include municipal and domestic wastewater, land surface runoff, municipal solid wastes and air pollutants. This program provides technical information for the Agency's operating programs in construction grants, comprehensive planning and solid and hazardous waste management.

Runoff Pollution Control — 611A

Extramural Funds: $803,000

Accomplishment Plan Summary: From 40% to 80% of the total annual organic loading entering receiving waters from a city is caused by urban runoff. In the 50% of the Nation's streams that are water quality limited, control of the pollution from wet weather flows must be considered as part of the strategy for maintaining stream quality. The stormwater management program objective spans the categories of: problem definition, users assistance tools, land management, collection systems control, storage, treatment sludge/solids, integrated systems, and technical assistance all for the three major subobjective categories of Combined Sewer Overflow, Urban Stormwater, and Hydrologic Modification.

The Office of Water and Hazardous Materials and the Office of Enforcement need receiving water impacts data and solution methodology tied to receiving water quality for respective program support. The principal effort and objective will be to fill the serious gaps in data/measurement impact assessment, abatement costs, and reduction techniques for optimized solution methodologies.

Laboratory Assignment: Municipal Environmental Research Laboratory, Cincinnati

Alaska Village Demonstration Program — 611B

Extramural Funds: $126,000

Accomplishment Plan Summary: The objective of this program is to demonstrate methods to provide central community facilities for safe water and elimination or control of pollution in those native villages of Alaska lacking such facilities. The primary objective during FY-77 will be to complete the evaluation of the two ongoing projects at Wainwright and Emmonak with a final report fully documenting the results to be completed by January, 1978. This report is to be prepared as a formal EPA Report to Congress.

Laboratory Assignment: Environmental Research Laboratory, Corvallis

Wastewater Treatment Technology — 611B

Extramural Funds: $5,122,000

Accomplishment Plan Summary: Program activities will be closely coordinated through interagency agreements, co-project funding, and other cooperative arrangements with other agencies. All program activities will stress energy conservation and disposal techniques and beneficial uses of residues. Guidelines will be issued on using sludge for timber production reclamation of marginal land and crop production. Processes or methods will be developed to mitigate the effects of metals and toxic substances on crops. Alternative forms of treatment will be developed that are less costly than secondary treatment for ocean discharges. Societal constraints to land spreading of sludge will be improved through films, farm associations, and various institutions.

Nearly one-third of the USA population is presently unsewered, and studies have shown that this percentage will not change drastically over the next twenty years. New alternative technologies to the traditional septic tank-soil absorption system will be developed. These systems will permit optimum uses of the land, i.e., methods which will eliminate building moratoria, de-facto zoning, health hazard conditions and economic hardships. Secondary benefits include increased tax bases, better community aesthetics through optimum development.

Significant initiatives in the area of disinfection have been made to overcome the problems of induced fish toxicity and the formation of chlorinated organics. Full-scale testing of ozonation and ultraviolet radiation will be carried out. Guidelines will be issued on unit process of disinfection that can be implemented in harmony with environmental goals.

Growing pressures to implement the potable reuse of wastewater for groundwater recharges and direct addition to domestic water supplies are causing concern among responsible health agencies. Treatment methods and health impacts of the reuse of wastewater for drinking purposes will be investigated to provide documentation and data for regulatory agencies in establishing potable reuse standards and criteria.

Laboratory Assignment: Municipal Environmental Research Laboratory, Cincinnati

Application of Wastewater to Land (Soil Treatment Systems) — 611C

Extramural Funds: $637,000

Accomplishment Plan Summary: The scope of this Accomplishment Plan includes the development and field evaluations of new or improved control technology for the effective and economical treatment of municipal wastewater effluents using the soil as a treatment media. Primary efforts are to be directed to demonstrate technologies for removal of nutrients, organic materials, and microorganisms. The potential for beneficial uses such as crop irrigation, animal grazing, soil conditioning, etc., and their compatibility with the basic treatment systems are to be evaluated. Definition of the technological factors for design, construction and operation of land application systems must be produced. Treatment capability, health factors, groundwater protection, loading factors, potential for instrumentation and automation must be defined. Development and evaluation of alternative cost-effective processes with firmly established dependability must be considered as alternatives for a broad spectrum of plant sizes, flow rates, feed characteristics, and climatic zones.

For this Accomplishment Plan the soil treatment area is considered divided into two technology subprogram areas: (1) Soil treatment systems—effluent treatment, and (2) aquaculture. The ultimate objective of this soil treatment program is the publication and wide distribution of useful planning and design manuals with adequate operation and maintenance backup taking into consideration all of the interacting factors, e.g., soils, groundwater, chemical/biological systems, climate, facility design, cropping, socio-political-economic-legal, and health effects, as a total treatment system.

Periodically, interim planning and design manuals should be published. The timing will be a function of the generation of new design data which will prove useful to the designer. As definitive specialized projects are completed, e.g., phosphorus model, effect of climate on design, etc., these projects should be published for distribution as technical reports. Concise design sections should then be melded into the planning and design manual. All activities should have as a principal objective the production of useful planning, design, operation, and maintenance data for the use of soil as a media for the treatment of wastewater effluents.

Laboratory Assignment: Robert S. Kerr Environmental Research Laboratory, Ada

Solid and Hazardous Waste Management — 618A

Extramural Funds: $1,834,000

Accomplishment Plan Summary: Develop, through studies, research and demonstrations, the technologies necessary to achieve environmentally acceptable and cost effective solid and hazardous waste management (generation through disposal) in which conservation and recovery of resources are prime considerations. The primary objectives are: (1) development of methodology and/or equipment to eliminate effects due to the release into the environment of materials present in solid and hazardous waste which would be adverse to the public health and welfare, (2) to evaluate, develop, and demonstrate new and/or improved management techniques, and new and/or improved methods of collection, storage, transportation and disposal, (3) to evaluate, develop, and demonstrate new or improved methods for the reduction, separation, processing and recovery of resources, including energy, and (4) to establish a technical basis to support the Agency's efforts in developing guidelines for solid and hazardous waste management.

Laboratory Assignment: Municipal Environmental Research Laboratory, Cincinnati

PUBLIC SECTOR ACTIVITIES PROGRAM AREA
WATER SUPPLY SUBPROGRAM

The Water Supply Subprogram includes research, development and demonstration activities relating to the provision of a dependably safe supply of drinking water and to the health effects resulting directly or indirectly from contaminants in drinking water. The research activities provide the technical information for the Agency's operating Water Supply Program as conducted under the Safe Drinking Water Act (Public Law 92–523).

Water Supply—Water Treatment and Systems Management — 614A

Extramural Funds: $3,956,000

Accomplishment Plan Summary: Develop new or improved technology for the effective and economical control of drinking water contaminants during storage, treatment and distribution. Program efforts will be directed toward evaluating technologies for limiting compliance with present and future primary drinking water standards. Improved methods of operating water supply facilities will be developed and evaluated. Specific attention will be given to the need of small water systems for innovative treatment methods.

Laboratory Assignment: Municipal Environmental Research Laboratory, Cincinnati

Water Supply Health Effects Research — 614B

Extramural Funds: $4,422,000

Accomplishment Plan Summary: Determine the nature and concentrations of organic, inorganic, and microbiological contaminants in water supplies. Evaluate through literature searches and short and long-term toxicological and epidemiological studies, the health effects of drinking water contaminants. Derive concentration limits necessary for the protection of the public health.

Laboratory Assignment: Health Effects Research Laboratory, Cincinnati

Water Supply—Ground Water Management — 614C

Extramural Funds: $1,030,000

Accomplishment Plan Summary: In order to protect existing and potential underground sources of drinking water, the following questions must be answered: (1) Define the pollution problem; (2) Identify sources of pollutants in the underground environment; (3) Establish waste disposal site selection criteria; (4) Develop management technology for underground drinking water basins; and (5) Investigate deep well injection and other waste disposal technology in terms of underground drinking water contamination.

Laboratory Assignment: Robert S. Kerr Environmental Research Laboratory, Ada

Water Supply Identification and Measurement — 614D

Extramural Funds: $606,000

Accomplishment Plan Summary: Develop and improve analytical techniques for the concentration, separation, identification and measurement of drinking water contaminants; namely, organic compounds, viruses and inorganic elemental analyses.

Laboratory Assignment: Environmental Research Laboratory, Athens

Water Supply—Identification and Measurement — 614D

Extramural Funds: $200,000

Accomplishment Plan Summary: The major objective of this Accomplishment Plan is to find improved or new methods for the determination of total organic carbon and purgable organics in drinking water.

Laboratory Assignment: Environmental Monitoring and Support Laboratory, Cincinnati

PUBLIC SECTOR ACTIVITIES PROGRAM AREA
ENVIRONMENTAL MANAGEMENT SUBPROGRAM

The Environmental Management Subprogram focuses on the development of improved procedures for planning, implementing, enforcing, and assessing cost-effective environmental protection strategies for particular problem areas (air, water, etc.) and development of a comprehensive planning procedure for integrating all environmental programs in an efficient manner, utilizing land use management as the basic integrating mechanism.

Environmental and Community Systems Management — 619A

Extramural Funds: $1,253,000

Accomplishment Plan Summary: The objective of this Accomplishment Plan is to provide regional and community environmental planners with a set of analytical procedures which can be used as effective management tools to identify feasible alternative solutions to identify environmental quality problems and to provide decision methodology and selection criteria for identifying least cost solutions. The program emphasizes the integration of structural and non-structural solutions using land use management as the basic framework or integrating mechanism. Non-structural efforts include development of improved problem assessment and planning techniques, and development of comprehensive community systems analysis and evaluation methodologies. The program will identify and analyze the positive and negative impacts of various pollution control technologies across environmental media (air, land, water); and will demonstrate the feasibility and benefits of integrated structural environmental technology management solutions.

The program output will be user oriented and will include both the information needed and the decision methodology required for selection and implementation of effective environmental quality control programs on a community and regional level.

Laboratory Assignment: Municipal Environmental Research Laboratory, Cincinnati
Environmental Research Laboratory, Athens
Robert S. Kerr Environmental Research Laboratory, Ada

MONITORING AND TECHNICAL SUPPORT PROGRAM AREA

The program includes both direct research activities and direct assistance and support to the rest of the Agency. This research program focuses on the development of reference or standard environmental measurement and monitoring equipment, techniques and systems, as well as development of Agency-wide quality assurance programs including standardization of analytical methods and sampling techniques. The components of this program are the Measurement Techniques and Equipment Development Subprogram, Quality Assurance Subprogram, and the Technical Support Subprogram.

MEASUREMENT TECHNIQUES AND EQUIPMENT DEVELOPMENT SUBPROGRAM

The Measurement Techniques and Equipment Development Subprogram is focused on providing approaches and measurement techniques for all pollutants (pesticides, toxic substances, industrial chemicals, petrochemicals, combustion products, etc.) in air, ground water, and surface waters (lakes, rivers, streams, estuaries, etc.). The spectrum of activities begins with the elucidation of fundamental physical, chemical or biological principles upon which monitoring techniques are based and ends with determination of the reliability and standardization of fully operational monitoring methods or systems.

Criteria Development for Selection of Stationary Source Measurement, Strategies, Methodologies, and Instrumentation — 605C

Extramural Funds: $100,000

Accomplishment Plan Summary: The objective of this effort is to develop the performance criteria to be used in identifying prescribed methods and monitoring systems and to establish test procedures by which criteria can be verified for stationary source measurement strategies. The specifications and procedures provided by this program are the basis for guidelines for monitoring systems in support of New Source Performance Standards.

Laboratory Assignment: Environmental Sciences Research Laboratory, Research Triangle Park

Monitoring Systems Development for Operation Applications — 612A

Extramural Funds: $288,000

Accomplishment Plan Summary; The objective of this effort is to provide the most efficient and effective monitoring techniques to meet the needs of EPA and related State monitoring programs. This includes the development, selection, modification, and adaptation of existing and proposed measurement technology specifically required to identify, characterize, and quantitate, all environmental pollutants for EPA and State water monitoring programs; the development and adaptation of improved monitoring techniques to improve the cost-effectiveness of monitoring operations; and the development of complete monitoring systems designs to establish and maintain the Agency's monitoring data bases. Emphasis shall be given to methods and techniques necessary to establish and enforce standards and regulations already promulgated, now under consideration for promulgation or of specific interest to EPA as potentially harmful to the environment. Priority shall be given to methods for toxic materials in industrial wastewaters, municipal wastes, fresh and marine waters and ground waters, and to techniques for the evaluation of hazards to human and aquatic populations from municipal and industrial discharges.

Laboratory Assignment: Environmental Monitoring and Support Laboratory, Cincinnati

Monitoring Systems Development for Operations Applications — 620A

Extramural Funds: $344,000

Accomplishment Plan Summary: The basic objective of this effort is to develop cost-effective and efficient monitoring systems and techniques which will provide the information required by EPA in meeting its regulatory and enforcement roles under present and anticipated legislative mandates. This objective will be met by application of optimization techniques and systematic approaches which permit clear identification and quantitative definition of the relationships between pollutant sources, their environment pathways, and exposure of dose-response relationships of the critical receptor(s), i.e., population(s) at risk. These approaches include adaptation and refinement of available and state-of-the-art monitoring instrumentation and technology such as modeling and biological methods, and the development of integrated (multimedia) monitoring concepts. In addition to providing data for fulfilling Agency mandates, application of advanced monitoring techniques and approaches will permit accurate assessments of the state of the environment so that timely decision can be made regarding presence and effects of regulated and presently nonregulated pollutants in the environment, including toxic substances, carcinogens, and heavy metals. A major goal is to provide more cost-effective monitoring systems, advanced methodology and techniques which will meet the specific Agency requirement for monitoring data; and to assist in developing specifications for these needs.

Laboratory Assignment: Environmental Monitoring and Support Laboratory, Las Vegas

Air Pollutant Characterization and Measurement — 712B

Extramural Funds: $3,330,000

Accomplishment Plan Summary: This Accomplishment Plan is designed to respond to the needs associated with the detailed description of the composition and level of air contaminants. This level of detail is necessary to elucidate parameters such as: chemical and physical interference, environmental constraints, and end-use requirements. The output of this Accomplishment Plan is new and/or improved methodology and instrumentation technology which will be utilized for stationary source, mobile source, and ambient air requirements that will support the development and maintenance of Agency air quality goals.

The outputs of this activity are requisite to the achievement of sub-objectives associated with the generation of air contaminants, their transport, transformation, decay, and ultimatic sinks. This technology is basic for the determination of atmospheric effects, atmospheric chemical and physical processes and the development and evaluation of air quality simulation modeling.

Laboratory Assignment: Environmental Sciences Research Laboratory, Research Triangle Park

New Techniques Development for Identification and Measurement of Chemical Constituents of Water and Soil — 713B

Extramural Funds: $234,000

Accomplishment Plan Summary: Develop new techniques to identify and measure all chemical constituents that relate to assessing, improving, and maintaining water quality through research and regulation. Techniques should identify and measure organic compounds and chemical elements, should determine the species of the chemical elements, and should relate responses to problems without necessarily identifying or measuring specific constituents (e.g. an instrument to measure cholinesterase enzyme inhibitors). Output should be a series of research reports describing techniques whose applicabilities to pertinent subobjectives have been assessed. The reports will describe equipment, operation, applicability and limitations. They will contain data from application to current Agency problems with analyses of the effectiveness of the techniques in these applications. The performing organization will be responsible for assisting users in developing competence in recommended techniques.

Laboratory Assignment: Environmental Research Laboratory, Athens

Methodology for Concentration, Recovery, and Identification of Viruses from Ambient Waters and Wastewaters — 713C

Extramural Funds: $193,000

Accomplishment Plan Summary: The objective of this effort is to develop rapid procedures for the concentration, recovery, and identification of viruses from water and associated media. Viruses, of concern in human health, appear in waters at about one active particle per gallon. About 200 particles are needed for traditional assay procedures. Rapid, efficient field methods are sought for recovering the virus particles in a concentrated form ready for shipment to a central laboratory. Present assay methods require up to ten days to provide results, consequently, more rapid assay methods are being pursued. There is also concern that human viruses may be transmitted in aquatic food organisms so there is some effort to determine whether human viruses are concentrated or propagated in fish. Implementation of water reuse systems will require rapid virus methods if the public health is to be protected. It is worthwhile to point out that viruses have some resistance to common disinfection procedures.

Laboratory Assignment: Environmental Monitoring and Support Laboratory, Cincinnati

MONITORING AND TECHNICAL SUPPORT PROGRAM AREA
QUALITY ASSURANCE SUBPROGRAM

The Quality Assurance Subprogram serves all environmental monitoring activities throughout the Agency, and, through the Regions and ORD laboratories, serves State and local environmental control programs. This Subprogram focuses on standardization of measurement methods, provision of standard reference materials and samples, development of quality control guidelines and manuals, on-site evaluations of all regional laboratories, inter-laboratory performance tests for air and pesticide measurements, monthly cross-check sample studies for State and private radiation laboratories, development of Agency-wide laboratory certification and quality assurance policies, studies for automation of laboratory instruments and statistical data handling, and participation in regional quality control meetings.

Quality Assurance — 621A

Extramural Funds: $363,000

Accomplishment Plan Summary: The objective of this Accomplishment Plan is to provide the reference or standard monitoring methods, quality control procedures, associated standard reference materials, and quality control program audits needed by the Agency's operational monitoring program in the acquisition of accurate and legally defensible ambient and source environmental quality data. Emphasis shall be given to the promulgation of those reference and equivalent methods and quality control procedures and the production of those standard reference materials needed to enforce air quality related standards and regulations now in existence and being planned for adoption.

Laboratory Assignment: Environmental Monitoring and Support Laboratory, Research Triangle Park

Quality Assurance — 621A

Extramural Funds: $1,212,000

Accomplishment Plan Summary: The objective of this effort is the development and delivery of reference methods and approval of equivalent methods, quality control systems and procedures, associated standard reference samples, and performance audit samples needed by the EPA and state monitoring programs for the acquisition of accurate and legally defensible drinking, ambient, and source environmental water quality data. In this role, EMSL-Cincinnati shall serve as the central management point for all water pesticide quality assurance activities, including those at the Health Effects Research Laboratory, Research Triangle Park, to assure internal consistency of this Agency-wide program. Emphasis shall be given to the reference methods and regulations now in existence or planned for adoption. Emphasis in fiscal year 1977 shall be on validation of methods for effluent discharges, drinking water, and toxic substances in both discharges and ambient waters and ground waters; standard reference samples and performance audit samples for these methods and substances; and development and operation of cost-effective systems for the maintenance of laboratory evaluation and performance data. Specific attention should be given to the establishment of an effective laboratory certification system for water supply laboratories by the development of acceptance criteria and procedures, development, and

distribution of quality control and performance samples, provision of guidance and assistance to the regional offices, and the development of a computerized laboratory performance and measurement methods record system. All measurement standardization and quality assurance activities for radionuclides will be closely coordinated with EMSL-Las Vegas.

Laboratory Assignment: Environmental Monitoring and Support Laboratory, Cincinnati

Development and Operation of a Total Quality Assurance Program for Pesticide Residues Measurements — 621B

Extramural Funds: $110,000

Accomplishment Plan Summary: It is of vital importance that all EPA pesticide laboratories in any given network maintain a rigid analytical quality control program to guarantee accurate and precise sample analyses. The reputation and testimony of laboratory personnel involved with pesticide analyses may be evaluated on the strength of the quality assurance program. To maintain such a program requires: (1) periodic interlab check samples; (2) provision of bulk samples of appropriate substrates suitable for use in intra quality control programs; (3) distribution of standardized materials important to successful analysis of pesticide residues; (4) studies; (5) provision of consultation and instrumental analytical backup for unusually difficult problems; (6) provision of training for laboratory personnel.

Failure to maintain a comprehensive quality assurance program will jeopardize any litigations involving pesticide residue analyses. Priorities include continuation of quality assurance support in pesticide residue analysis to the Office of Pesticide Programs (OPP): (a) Epidemiologic Studies Laboratories, (b) National Human Monitoring Program, and (c) other associated OPP programs.

Laboratory Assignment: Health Effects Research Laboratory, Research Triangle Park

MONITORING AND TECHNICAL SUPPORT PROGRAM AREA
TECHNICAL SUPPORT SUBPROGRAM

The Technical Support Subprogram provides assistance in all fields of environmental science that the Office of Research and Development provides to other components of the Agency and in many cases to elements outside of EPA. It has been the policy of ORD to provide assistance for the immediate technical needs of the Agency whenever possible by drawing on the expertise of its research personnel. In the past, costs associated with this effort have been absorbed in the base program. This fiscal year, these costs are being identified and planned for separately. The decision to identify technical support work separately reflects a determination that ORD will be more responsive to the immediate needs of EPA.

The Technical Information Program is included under this Subprogram. The main purpose of the Technical Information Program is to deliver the results of ORD's research program to the user community in a form that is tailored to the user's needs. The program includes technology transfer, publications, and library oversight.

Additionally, the Minority Institutions Research Support Program (MIRS) is included under the Technical Support Subprogram. The purpose of the MIRS program is to assist approximately 100 minority colleges and universities in the development of their environmental research capabilities which are utilized through grant projects to provide certain technical support to Agency research problems.

Provision of Technical Support to Agency Programs and Regional Offices: (Air) 606B — (Water) 613B — (Interdisciplinary) 622A

Extramural Funds: $496,300

Accomplishment Plan Summary: The following items are representative of the types of requests received for technical support. Since the requests exceed the budget, specific requests to be funded must be determined through negotiations with the program offices: (1) Assist Regional and program offices with unique water monitoring capability, utilizing amphibious aircraft and specialized instrument packages; (2) Assist Regional and program offices with unique air monitoring techniques, primarily aircraft mounted systems; (3) Provide analytical, quality control and laboratory evaluation services in support of the Rural Water Survey and National Pollution Discharge Elimination System (NPDES); (4) Assist Regions in adapting models to the optimum siting of monitoring stations; (5) Assist Regional and program offices in documenting pollution sources and assessing their impact on the environment with emphasis on the use of overhead remote sensing techniques; and (6) Assist Regional and program offices in documenting and assessing the nature, extent and impacts of episodal environmental insults such as spills, accidental releases and air pollution episodes.

Laboratory Assignment: Environmental Monitoring and Support Laboratory, Las Vegas

Minority Institutions Research Support Program — 622B

Extramural Funds: $625,000

Accomplishment Plan Summary: The objectives of the Minority Institutions Research Support Program are: (1) To identify existing and potential environmental research capability within minority institutions and assist these institutions in utilizing this capability to participate in EPA research activities; (2) To help minority institutions become more competitive with other institutions for research funds; (3) To award research and demonstration grants to minority institutions in a manner which will support the research objectives of the Office

of Research and Development; and (4) To promote a good working relationship between the Agency and participating institutions.

Laboratory Assignment: Office of Monitoring and Technical Support, Headquarters

Technology Transfer Program — 622C

Extramural Funds: $1,588,000

Accomplishment Plan Summary: The fundamental objective of the EPA Technology Transfer Program is to impact effectively the design, construction, installation and operation of pollution control and abatement facilities through the active transfer of the latest available technologies to potential users and thus mitigate the potential for large national investment in obsolete technology. The form of outputs provided by this program includes design manuals, seminar publications, capsule reports, movies, displays, exhibits, newsletters, etc.

In fiscal year 1977, the scope of the Technology Transfer Program will be expanded to include not only its historical mission of transferring proven and demonstrated environmental pollution control technology, but also to encompass the active dissemination and transfer of technical information to users both within and external to the Agency. The fiscal year 1977 program will continue to transfer on a priority basis technologies in the areas of land treatment, municipal waste treatment, industrial pollution control technology, non-point sources, water supply, monitoring technology and energy research and development. It will also support priority technical information dissemination initiatives such as areawide waste treatment management (208) planning seminars and regional state-of-the-art technology seminars.

Laboratory Assignment: Industrial Environmental Research Laboratory, Cincinnati

Technical Information Management Activities — 622E

Extramural Funds: $441,000

Accomplishment Plan Summary: The principal objective of the Technical Information Division, Office of Monitoring and Technical Support, is to provide centralized management, planning, coordination and review functions which are necessary to assure the effective and timely dissemination of technical information including technology transfer into the Office of Research and Development (ORD), between ORD components and from ORD to a broad spectrum of users who rely on research and development outputs for environmental decision making. The major activities assigned to the Technical Information Division include: technology transfer, technical and scientific publications, library control, Freedom of Information Act compliance, environmental forecast modeling and response to inquiries for technical information inside and outside ORD.

Laboratory Assignment: Office of Monitoring and Technical Support, Headquarters

Technical Information Support Program — 622F

Extramural Funds: $50,000

Accomplishment Plan Summary: The principal objective of the Technical Information Support Program is to provide technical information support services which will optimize the transfer of technical information into the Office of Research and Development (ORD), between ORD components and from ORD to the environmental research and development user community. The scope of these support services includes, but is not limited to, the following: centralized management, processing, publication and distribution of technical/scientific publications, information booklets, newletters, etc.; graphic arts, technical editing and television support services; planning, implementation, coordination and maintenance of special information systems and data bases; support for technical information inquiries from sources both internal and external to the Agency.

Laboratory Assignment: Industrial Environmental Research Laboratory, Cincinnati

PART III

Office of Research and Development's Grant and Contract Activities*/

While some of the research required by these Accomplishment Plans will be done in-house by ORD's staff, much of the research is planned for accomplishment by grant, contract, or interagency agreement. The Laboratory Director decides how the goals of the Accomplishment Plan can best be achieved. This project level planning is documented in Work Plans. The Work Plans describe each project or task required to accomplish the research objective, indicate how the task will be implemented (i.e., grant, contract, in-house), and estimate the amount of dollars required to complete the task.

All planned contracting is carried out competitively with notices of the availability of Request for Proposal (RFP) documents publicly advertised. Unsolicited contract proposals should *not* be submitted for such projects. The review/selection procedures followed may vary slightly from project to project, but all pertinent information regarding both the project objectives and criteria for evaluation of proposals will be included in each RFP package. The Laboratory Director should not be contacted for information on contracts that have been advertised since such communication may conflict with Federal Procurement Regulations and could serve to disqualify a prospective contractor from further consideration.

With regard to all grant projects, contact with the cognizant Laboratory Director is encouraged. The Laboratory Director will generally be the individual responsible for making the award/reject recommendation on individual proposals.

*/Note: Information on other EPA grant programs is presented in the publication "Grant Assistance Programs of the Environmental Protection Agency", available from EPA's Grants Administration Division, Washington, DC 20460. Information on contracting procedures and policies is presented in the booklet, "Contracting with EPA — A Guide for Prospective Contractors", available from EPA's Contracts Management Division, Washington, DC 20460.

Guidelines For Submission Of Grant Applications Or Contract Proposals

A. Solicited contract proposals –

Requests for Proposals (RFP's) for all planned contracts will be advertised in the Commerce Business Daily issued by the U.S. Department of Commerce. A subscription to this publication may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402. These advertisements will provide instructions for obtaining RFP packages from EPA's Contracts Management Division. Each RFP package will include detailed information describing the form and context of proposals to be submitted as well as the required time and place of submission.

EPA's Contracts Management Division publishes "Contracting With EPA – A Guide for Prospective Contractors" to assist the business community in its efforts to find new markets in the Environmental Protection Agency. This publication includes the names and addresses of contracting offices in EPA and the Office of Research and Development laboratories, the types of products and services procured, general information about the Agency, and hints to aid businessmen in selling to EPA.

B. Unsolicited contract proposals –

While most of OR&D's contract research and demonstration is conducted through use of RFP's to solicit proposals (item A above), contracts can also be awarded on the basis of unsolicited proposals which meet the sole-source requirements of the Federal Procurement Regulations. Unsolicited contract proposals should be addressed to the Grants Administration Division (PM-216), Environmental Protection Agency, Washington, DC 20460. While no specific format is required, such proposals should generally contain:

1. Name, address and telephone number of the organization or individual submitting the proposal.
2. Date of preparation or submission.
3. Type of organization (profit, non-profit, educational, individual, other).
4. Concise title.
5. Project objective.
6. Need, utility and significance of project.
7. Scope of work, i.e., an outline and discussion of the purpose of proposed effort of activity, the method of attacking the problem, and nature and extent of anticipated results.
8. Experimental data developed by feasibility studies previously completed.
9. Estimated duration of the project, proposed starting and completion dates.
10. Scientific or technical references.
11. Names of key personnel to be involved, brief biographical information, including principal publications and relevant experience.
12. Equipment, facilities and personnel requirements.

13. Proposed budget, including separate cost estimates for salaries and wages, equipment, expendable supplies, services, travel, subcontracts, other direct costs and overhead.

EPA's FY-77 Appropriation Act specifically provides that cost sharing must be included in contracts resulting from proposals for projects not specifically solicited. The extent of the cost sharing by the recipient will be decided after the proposal has been reviewed and determined to be of mutual interest to the grantee or contractor and the government.

The material submitted should contain both a *technical* and a *business* proposal. The *technical* proposal should clearly define the unique concept involved (as required for sole-source procurements) and include a plan for turning the concept into reality. It is suggested that the technical proposal identify any proprietary aspects of the proposed ideas or process. The *business* proposal should include a detailed cost proposal, information concerning past Government contracts, and any special terms and conditions desired.

C. Research or demonstration grant applications –

Pre-application activity —

Although grant applications may be submitted at any time and on any subject, potential grantees should take the following actions prior to submission of a formal grant application in order to save time and effort both for the applicant and EPA.

1. Review OR&D's current research program, as described in Part II, to determine if funds are available in the specific area of interest; and

2. Contact the appropriate research and development personnel cited in this document to ascertain if a grant project is planned prior to submission of an official grant application.

Submission of a preproposal is also strongly encouraged. The preproposal should be sent directly to the cognizant Laboratory Director listed in Part II of this document for review. A preproposal should normally consist of a three or four-page narrative outlining the project concept and containing the following information:

1. **Objective** – a clear statement of the specific objective is necessary. If the objective is designed to fulfill a specific project (as identified in Step 1 above), the project should be identified. If the objective cannot be associated with any specific project, some statement of the presumed value to EPA of attaining the research objective should be made.

2. **Project Plan** – a brief description of the research/development/demonstration concept and the plan for execution of the proposed project, including a projected time-schedule for accomplishments of intermediate outputs or key occurrences indicating progress (milestones) and the final objective.

3. **Budget** – a preliminary estimate of total costs which will be incurred in order to complete the project. Also, the share of the costs which will be provided by the applicant should be indicated.

4. **Staff and Facilities** – a brief listing of key project staff and capabilities and a brief description of any special facilities or other factors which would contribute to the success of the project. A single person who will have responsibility for planning, coordinating, and supervising the project should be identified along with the fraction of his time to be devoted to the project.

Following review and evaluation of the preproposal by the cognizant Laboratory Director, the prospective applicant will be advised whether (a) an application should be submitted for formal review, (b) submission of a modified preproposal is suggested, (c) possible submission of the preproposal to another Agency, Department, or source of funds is suggested, or (d) further pursuit of the particular topic is discouraged.

Formal applications —

All formal grant applications are to be submitted to the Grants Administration Division, Environmental Protection Agency, Washington, DC 20460. After formal "logging in" and acknowledgement, those applications falling within the Office of Research and Development's purview are referred to the appropriate ORD program office for program relevance review by the cognizant Laboratory Director. This review quickly screens out those applications for which EPA has no authority or interest or those for which no funds are available. For those proposals in which ORD has an interest, scientific/technical merit reviews are then conducted by *both* in-house and extramural experts. Extramural reviews are obtained in the National Science Foundation fashion — individual written reviews submitted by mail. Comments are also obtained from the Regional Office in the Region where the applicant is located and where the project would be conducted to determine the relationship of the proposed project to Regional programs and policies.

The individual coordinating the scientific/technical merit review (normally the cognizant Laboratory Director) assembles and evaluates both intramural and extramural review comments and prepares a recommendation for action on each application. The recommendation may be to award a grant, to reject the application, or to attempt to negotiate with the applicant to modify the scope of work. In those cases where the proposed scope of work could be modified in order to relate more directly to EPA's objectives and thereby qualify for funding, direct contact is made with the applicant to determine whether or not acceptable adjustments in the scope of work can be made.

APPENDIX A

OFFICE OF RESEARCH AND DEVELOPMENT

PROGRAM-BUDGET STRUCTURE AND CODES

Program Code	Component Title
	AIR
1AA	**Health and Ecological Effects**
1AA601	Health Effects
1AA602	Ecological Processes and Effects
1AA603	Transport and Fate of Pollutants
1AB	**Industrial Processes**
1AB604	Minerals, Processing and Manufacturing Industries
1AD	**Monitoring and Technical Support**
1AD605	Measurement, Techniques and Equipment Development
1AD606	Technical Support
1AD712	Characterization and Measurement Methods Development
	WATER QUALITY
1BA	**Health and Ecological Effects**
1BA607	Health Effects
1BA608	Ecological Processes and Effects
1BA609	Transport and Fate of Pollutants
1BB	**Industrial Processes**
1BB610	Minerals, Processing and Manufacturing Industries
1BC	**Public Sector Activities**
1BC611	Waste Management
1BD	**Monitoring and Technical Support**
1BD612	Measurement, Techniques and Equipment Development
1BD613	Technical Support
1BD713	Characterization and Measurement Methods Development
	WATER SUPPLY
1CC	**Public Sector Activities**
1CC614	Water Supply
	SOLID WASTE
1DC	**Public Sector Activities**
1DC618	Waste Management

Program Code	Component Title
	PESTICIDES
1EA	**Health and Ecological Effects**
1EA615	Health Effects
1EA714	Ecological Processes and Effects
	RADIATION
1FA	**Health and Ecological Effects**
1FA628	Health Effects
	INTERDISCIPLINARY
1HA	**Health and Ecological Effects**
1HA616	Ecological Processes and Effects
1HA630	Health Effects
1HB	**Industrial Processes**
1HB617	Renewable Resources Industry
1HC	**Public Sector Activities**
1HC619	Environmental Management
1HD	**Monitoring and Technical Support**
1HD620	Measurement, Techniques and Equipment Development
1HD621	Quality Assurance
1HD622	Technical Support
	TOXIC SUBSTANCES
1LA	**Health and Ecological Effects**
1LA629	Health Effects
1LA715	Ecological Processes and Effects
	ENERGY
1NE	**Energy**
1NE623	Extraction and Processing Technology
1NE624	Conservation and Utilization Technology Assessment
1NE625	Health and Ecological Effects
1NE626	Technical Support

APPENDIX B

EXTRAMURAL PROGRAM AUTHORIZING LEGISLATION

This Appendix describes the legislative authorities within which the Office of Research and Development must operate.

Auth. Leg. Code

14

Statutory authority: Section 14, Noise Control Act of 1972 (P.L. 92–574) 42 U.S.C. 4900.

Purpose: To conduct research on the effects, measurement and control of noise including, but not limited to, investigation of the psychological and physiological effects of noise on humans and the effects of noise on domestic animals, wildlife and property and determination of acceptable levels of noise on the basis of such effects, the development of improved methods and standards for measurement and monitoring of noise and the determination of the most effective and practical means of controlling noise emissions.

Eligible grantees: Non-profit institutions of higher education or non-profit organizations whose primary purpose is the conduct of scientific research.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: None

20

Statutory authority: Section 20, Federal Insecticide, Fungicide and Rodenticide Act, as amended (P.L. 92–516) --- 7 U.S.C. 135 et seq.

Purpose: To develop biologically integrated alternatives for pest control and to conduct other research as necessary to carry out the purposes of the Act.

Eligible grantees: Universities or others.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: None

103

Statutory authority: Section 103, Clean Air Act, as amended (P.L. 88–206) --42 U.S.C. 1857 b.

Purpose: To support and promote the coordination of research, development and demonstration projects relating to the causes, effects, extent, prevention and control of air pollution.

Eligible grantees: Air pollution control agencies, other public or non-profit private agencies, institutions and organizations and individuals.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: None

104

Statutory authority: Section 104, Clean Air Act, as amended (P.L. 88–206) --42 U.S.C. 1857 b-1.

Purpose: To support research and development projects on new and improved methods having industrywide application for the prevention and control of air pollution resulting from the combustion of fuels.

Eligible grantees: Public or nonprofit agencies, institutions, organizations and individuals.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project or $1,500,000, whichever is less.

Other limitations: None

104b

Statutory authority: Section 104 (b)(3), Federal Water Pollution Control Act, as amended, (P.L. 92–500) --- 33 U.S.C. 1254.

Purpose: Conduct and promote the coordination and acceleration of research, investigations, experiments and demonstrations relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution.

Eligible grantees: State water pollution control agencies, interstate agencies, other public or nonprofit private agencies, institutions, organizations and individuals.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: None

105

1) **Statutory authority:** Section 105 (a), Federal Water Pollution Control Act, as amended, (P.L. 92–500) 33 U.S.C. 1255.

Purpose: To assist in the development of (1) projects to demonstrate new or improved methods of preventing, reducing, and eliminating the discharges into any waters of pollutants from sewers which carry storm water or both storm water and pollutants; or (2) projects to demonstrate advanced waste treatment and water purification methods or new or improved methods of joint treatment systems for municipal and industrial wastes.

Eligible grantees: States, municipalities or inter-municipal or interstate agencies.

Funding limitations: Grants may not exceed 75 percent of the estimated total eligible cost of the project.

Other limitations: Proposed projects must have been approved by the appropriate State Water Pollution Control agency or agencies. In addition, the Administrator must determine that such project will serve as a useful demonstration for the purpose as set forth above.

105 2) **Statutory authority:** Section 105 (b).

Purpose: To demonstrate in river basins or portions thereof, advanced treatment and environmental enhancement techniques to control pollution from all sources including non-point sources, together with instream water quality improvement techniques.

Eligible grantees: States or interstate agencies.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: None

3) **Statutory authority:** Section 105 (c).

Purpose: To support research and demonstration projects for prevention of pollution of any waters by industry including but not limited to, the prevention, reduction, and elimination of the discharge of pollutants.

Eligible grantees: Individuals, corporations, partnerships, associations, States, municipalities, commissions or political subdivisions of a State, or any interstate body.

Funding limitations: Grants may not exceed 75 percent of the estimated total eligible cost of the project.

Other limitations: The Administrator must determine that the project will develop or demonstrate a new or improved method of treating industrial wastes or otherwise prevent pollution by industry, which method shall have industrywide application.

4) **Statutory authority:** Section 105 (d).

Purpose: To develop, refine and achieve practical application of: (1) waste management methods applicable to point and non-point sources of pollutants to eliminate the discharge of pollutants, including, but not limited to, elimination of runoff of pollutants and the effects of pollutants from inplace or accumulated sources; (2) advanced waste treatment methods applicable to point and non-point sources, including inplace or accumulated sources of pollutants, and methods for reclaiming and recycling water and confining pollutants so they will not migrate to cause water or other environmental pollution; and (3) improved methods and procedures to identify and measure the effects of pollutants on the chemical, physical and biological integrity of water, including those pollutants created by new technological developments.

Eligible grantees: Individuals, corporations, partnerships, associations, States, municipalities, commissions, or political subdivisions of a State, or any interstate body.

Funding limitations: Grants may not exceed 75 percent of the estimated total eligible cost of the project.

Other limitations: None

105 5) **Statutory authority**: Section 105 (e).

Purpose: To support research and demonstration projects with respect to new and improved methods of preventing, reducing, storing, collecting, treating, or otherwise eliminating pollution from sewage in rural and other areas where collection of sewage in conventional, community-wide sewage collection systems is impractical, uneconomical, or otherwise infeasible, or where soil conditions or other factors preclude the use of septic tank and drainage field systems.

Eligible grantees: Individuals, corporations, partnerships, associations, States, municipalities, commissions, or political subdivisions of a State or any interstate body.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: Grants must be made in consultation with the Secretary of Agriculture or other interested Federal agencies.

107 **Statutory authority:** Section 107, Federal Water Pollution Control Act, as amended, (P.L. 92–500) --- 33 U.S.C. 1257.

Purpose: To demonstrate comprehensive approaches to the elimination or control of acid or other mine water pollution resulting from active or abandoned mining operations and other environmental pollution affecting water quality within all or part of a watershed or river basin, including siltation from surface mining.

Eligible grantees: Individuals, corporations, partnerships, associations, States, municipalities, commissions, or political subdivisions of a State, or any interstate body.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: In selecting watersheds, the Administrator shall be satisfied that the project area will not be affected adversely by the influx of acid or other mine water pollution from nearby sources. The State shall acquire any land or interests therein necessary for such project and the State shall provide legal and practical protection to the project area to insure against any activities which will cause future acid or other mine water pollution. In addition, for any demonstration project in the Appalachian region (as defined in Section 403 of the Appalachian Regional Development Act of 1965, as amended) the Appalachian Regional Commission shall determine that such demonstration project is consistent with the objectives of the Appalachian Regional Development Act of 1965, as amended.

113

Statutory authority: Section 113, Federal Water Pollution Control Act, as amended (P.L. 92–500) --- 33 U.S.C. 1263.

Purpose: To demonstrate methods to provide for central community facilities for safe water and elimination or control of water pollution in those native villages of Alaska without such facilities.

Eligible grantees: The State of Alaska.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: Projects shall include provisions for community safe water supply system, toilets, bathing and laundry facilities, sewage disposal facilities, and other similar facilities, and educational and informational facilities and programs relating to health and hygiene. Such demonstration projects shall be for the further purpose of developing preliminary plans for providing such safe water and such elimination or control of pollution for all native villages in Alaska.

204*

Statutory authority: Section 204, Solid Waste Disposal Act, as amended (P.L. 89–272) --- 42 U.S.C. 3253.

Purpose: To support and promote the coordination of research, development and demonstration projects relating to any adverse health and welfare effects of the release into the environment of material present in solid waste and methods to eliminate such effects, the operation and financing of solid waste disposal programs, the reduction of the amount of such waste and unsalvageable waste materials, the development and application of new and improved methods of collecting and disposing of solid waste and processing and recovering materials and energy from solid waste, and the identification of solid waste components and potential materials and energy recoverable from waste components.

Eligible grantees: Public or private agencies and institutions and individuals.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: All information, uses, processes, patents and other developments resulting from these projects will be made readily available on fair and equitable terms to industries utilizing methods of solid waste disposal and industries engaging in furnishing devices, facilities, equipment and supplies to be used in connection with solid waste disposal.

301

Statutory authority: Section 301, Public Health Service Act, as amended (P.L. 78–410) --- 42 U.S.C. 241.

Purpose: To support and promote the coordination of research projects for the determination of the extent and character of radiation problems, mechanisms of radiation damage in humans, improvements in techniques for assessing the effects of radiation and radiation dose-disease relationship.

Eligible grantees: Universities, hospitals, laboratories and other public or private institutions or individuals.

Funding limitations: Grants may not exceed 95 percent of the estimated total eligible cost of the project.

Other limitations: All grants must be recommended by the National Advisory Health Council.

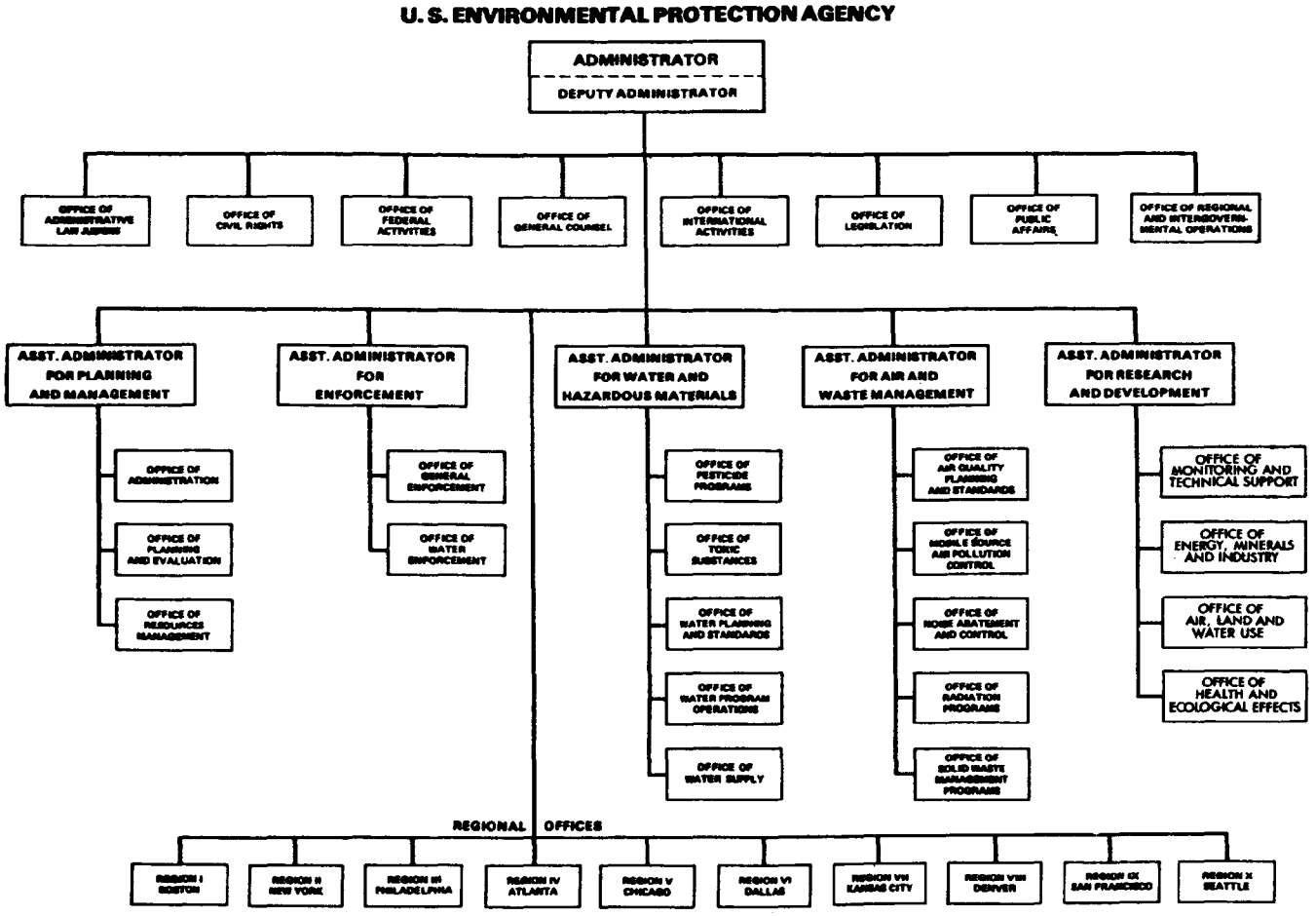
Mixed

Statutory authority and other requirements can be any of the listed laws or the Grants Act, 42 U.S.C. 1891, depending upon the specific purpose of the project.

*The new Solid Waste Disposal Act was pending Presidential approval at the time this document was ready for printing.

**Copies of the new Toxic Substances Control Act had not been released at the time this document was ready for printing.

APPENDIX C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OFFICE OF REGIONAL AND INTERGOVERNMENTAL OPERATIONS
ASST. ADMINISTRATOR FOR PLANNING AND MANAGEMENT
ASST. ADMINISTRATOR FOR ENFORCEMENT
ASST. ADMINISTRATOR FOR WATER AND HAZARDOUS MATERIALS
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REGION II NEW YORK
REGION III PHILADELPHIA
REGION IV ATLANTA
REGION V CHICAGO
REGION VI DALLAS
REGION VII KANSAS CITY
REGION VIII DENVER
REGION IX SAN FRANCISCO
REGION X SEATTLE

APPENDIX D

EPA OFFICIALS AND REGIONAL CONTACTS

	Telephone*	States Served
Administrator **Russell E. Train** Environmental Protection Agency A – 100 Washington, DC 20460	(202) 755–2700	
Office of Regional and Intergovernmental Operations **Peter L. Cashman** Environmental Protection Agency A – 101 Washington, DC 20460	(202) 755–0444	
Region I		
Environmental Protection Agency Room 2203 John F. Kennedy Federal Building Boston, Massachusetts 02203		Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont
Regional Administrator John A. S. McGlennon	(617) 223–7210	
Deputy Regional Administrator Kenneth Johnson	(617) 223–7210	
Public Affairs Director Paul G. Keough	(617) 223–4704	
R&D Contact Richard Keppler	(617) 223–3477	
Region II		
Environmental Protection Agency Room 1009 26 Federal Plaza New York, New York 10007		Delaware New Jersey New York Puerto Rico
Regional Administrator Gerald M. Hansler	(212) 264–2525	
Deputy Regional Administrator Eric B. Outwater	(212) 264–2525	

	Telephone*	States Served
Public Affairs Director Donald R. Bliss, Jr.	(212) 264–2515	
R&D Contact Robert W. Mason	(212) 264–3100	

Region III

Environmental Protection Agency Curtis Building 6th & Walnut Streets Philadelphia, Pennsylvania 19106		District of Columbia Maryland Pennsylvania West Virginia Virginia
Regional Administrator Daniel J. Snyder III	(215) 597–9814	
Deputy Regional Administrator Alvin R. Morris	(215) 597–9814	
Congressional and Public Affairs Director Diane Margenau	(215) 597–9370	
R&D Contact Albert Montague	(215) 597–9856	

Region IV

Environmental Protection Agency 345 Courtland Street, N.E. Atlanta, Georgia 30308		Alabama Florida Georgia Kentucky Mississippi South Carolina Tennessee
Regional Administrator Jack E. Ravan	(404) 526–5727 CML 285–5727 FTS	
Deputy Regional Administrator John A. Little	(404) 526–5727 CML 285–5727 FTS	
Public Affairs Director Charles D. Pou	(404) 526–3004 CML 285–3004 FTS	
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Region V

Environmental Protection Agency 230 S. Dearborn Chicago, Illinois 60604		Illinois Indiana Michigan

	Telephone*	States Served
		Minnesota
Regional Administrator		Ohio
George R. Alexander, Jr.	(312) 353–2000	Wisconsin
Deputy Regional Administrator		
Valdas V. Adamkus	(312) 353–2000	
Public Affairs Director		
Frank M. Corrado	(312) 353–5800	
R&D Contact		
Clifford Risley, Jr.	(312) 353–2200	

Region VI

Environmental Protection Agency		Arkansas
1201 Elm Street		Louisiana
First International Building		New Mexico
Dallas, Texas 75270		Oklahoma
		Texas
Regional Administrator		
John C. White	(214) 749–1962	
Deputy Regional Administrator		
(Vacant)		
Public Affairs Director		
Betty Williamson	(214) 749–1962	
R&D Contact		
Mildred Smith	(214) 749–3971	

	Telephone*	States Served
Region VII		
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Regional Administrator Jerome H. Svore	(816) 374–5493 CML 758–5493 FTS	
Deputy Regional Administrator Charles V. Wright	(816) 374–5493 CML 758–5493 FTS	
Public Affairs Director Randall S. Jessee	(816) 374–5894 CML 758–5894 FTS 758–5894	
R&D Contact Aleck Alexander	(816) 374–2921 CML 758–2921 FTS	
Region VIII		
Environmental Protection Agency Suite 900 1860 Lincoln Street Denver, Colorado 80203		Colorado Montana North Dakota South Dakota Utah Wyoming
Regional Administrator John A. Green	(303) 837–3895 CML 327–3895 FTS	
Deputy Regional Administrator Roger L. Williams (Acting)	(303) 837–3895 CML 327–3895 FTS	
Public Affairs Director Howard W. Kayner	(303) 837–4905 CML 327–4905 FTS	
R&D Contact John E. Hardaway	(303) 837–3849 CML 327–3073 FTS	
Region IX		
Environmental Protection Agency 100 California Street San Francisco, California 94111		Arizona California Hawaii Nevada
Regional Administrator Paul DeFalco, Jr.	(415) 556–2320	
Deputy Regional Administrator L. Russell Freeman	(415) 556–2320	

	Telephone*	States Served
Chief, External & Inter-Governmental Relations Branch, Allan Abramson	(415) 556–6266	
R&D Contact William Bishop	(415) 556–6925	

Region X

Environmental Protection Agency 1200 6th Avenue Seattle, Washington 98101		Alaska Idaho Washington Oregon
Regional Administrator Donald P. DuBois	(206) 442–1220 CML 399–1220 FTS	
Deputy Regional Administrator L. Edwin Coate	(206) 442–1220 CML 399–1220 FTS	
Public Affairs Director Robert H. Jacobson	(206) 442–1203 CML 399–1203 FTS	
R&D Contact Robert Courson	(206) 442–1296 CML 399–1296 FTS	

*Telephone numbers are both commercial and FTS unless otherwise indicated.

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EPA-600/9-76-029		

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Program Guide provides the public with information on the Office of Research and Development's current extramural research program and serves as a guide to Office of Research and Development's key personnel. This publication will be updated each fiscal year.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Guides (instructions), Organization Charts, Grants, Contracts, Financial Management, Research Management	Research programs, Health and Ecological Effects, Energy program, Industrial Processes, Public Sector, Monitoring and Technical Support	5A

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APPENDIX E
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Complete this form and return it to the address listed below if you wish your name added to or retained on the mailing list for the ORD Program Guide.

_____

Name of Organization

_____

Sub-Division or Department

_____

Street Address

_____

City State Zip

_____

Individual Contact

Complete the above information and mail to:

Office of Financial and Administrative Services (RD-674)
Office of Research and Development
Environmental Protection Agency
Washington, DC 20460