REPORT OF THE COMPTROLLER GENERAL OF THE UNITED STATES

General Accounting Office Reviews Of Federal Environmental Research And Development

Environmental Protection Agency

GAO reviews confirm that there is no overall Federal leadership for environmental research nor does there appear to be adequate coordination of the water, air, and pesticide research efforts.

RED-76-95

APRIL 7, 1976

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-166506

The Honorable George E. Brown, Jr.
Chairman, Subcommittee on Environment
and the Atmosphere
Committee on Science and Technology
House of Representatives

Dear Mr. Chairman:

In various meetings with our staff during November and December 1975, you said that numerous Federal agencies were spending about $1.2 billion a year on environmental research, of which the Environmental Protection Agency spent about 20 percent, but apparently there was no leadership for such research nor did there appear to be adequate coordination of the research effort. You said that the Subcommittee was very much concerned about this.

We have made several reviews of Federal environmental research programs during which we examined the extent of coordination among the Federal agencies involved in such research. On January 16, 1974, we issued a report to Congress entitled "Research and Demonstration Programs To Achieve Water Quality Goals: What the Federal Government Needs to Do" (B-166506). On December 11, 1975, we issued a report to the Chairman, Subcommittee on Environment, Senate Committee on Commerce, entitled "Federal Programs For Research On the Effects of Air Pollutants" (RED-76-46). We have also looked into Federal pesticide research programs (no report was issued) and are currently reviewing noise and solid waste programs. We discuss these reports and reviews in detail in the appendix.

In our January 16, 1974, report we said that the Environmental Protection Agency had not had a water quality research and development (R&D) strategy setting forth goals, objectives, and priorities since it was formed in December 1970. We recommended that the Administrator prepare an R&D strategy to carry out the agency's R&D requirements under the Federal Water Pollution Control Act Amendments of 1972. The agency said that it basically agreed with our recommendation and had taken or was planning to take

action to modify its R&D planning process to insure greater responsiveness to the R&D needs of its operating and regulatory programs and to start preparing R&D strategies to interface with these programs.

To a large extent, Federal water pollution R&D activities have been diverse, fragmented, and uncoordinated. We found that no formal mechanism existed for coordinating the Federal water pollution R&D efforts among the many Federal agencies. Several studies have also identified the need for better coordination of Federal water pollution research information.

Because the Office of Management and Budget is responsible for insuring that Federal programs are coordinated and that funds are spent in the most economical manner, we recommended that the Director, Office of Management and Budget, designate a Federal agency as a focal point to coordinate and promote the dissemination of water pollution research results. As of March 1976 the Office had not designated such an agency.

In our December 1975 report, we said that air pollution research was not formally coordinated among the Federal agencies, although the Clean Air Act directed the Administrator to "* * * promote the coordination and acceleration of research* * *." We found that the agency had taken little action to promote coordination of research. We therefore recommended that the Administrator develop written policies and regulations that will enable the agency to fulfill its responsibility to coordinate research under the Clean Air Act. In a reply to this recommendation, the agency listed various coordinating efforts in progress. We still believe that the Environmental Protection Agency needs to take further action on the matter.

Our review of Federal pesticide R&D programs showed that there were coordination problems similar to those discussed in our reports on air and water research. Our work on noise and solid waste R&D is only in the preliminary stages, and therefore we have not reached conclusions as to the adequacy of coordination of such R&D among the various agencies. We will provide you with copies of any reports we issue in the future on this work.

In summary, our reviews confirm that there is no overall Federal leadership for environmental research nor does there appear to be adequate coordination of the water, air, and pesticide research efforts.

Sincerely yours,

Comptroller General
of the United States

SUMMARY OF GAO REVIEWS OF FEDERAL ENVIRONMENTAL RESEARCH PROGRAMS

Pursuant to the request of the Chairman, Subcommittee on Environmental and the Atmosphere, House Committee on Science and Technology, the following sections summarize our issued reports and ongoing work concerning Federal environmental research and development. This summary includes our work on water, air, pesticides, noise, and solid waste R&D.

WATER POLLUTION R&D

On January 16, 1974, we issued a report to the Congress entitled "Research and Demonstration Programs to Achieve Water Quality Goals: What the Federal Government Needs To Do" (B-166506). In that report we pointed out that a number of agencies were involved in water pollution R&D. The Federal agencies involved and the estimated funding for fiscal years 1969-73 are listed below.

Department or agency	Estimated funding (000 omitted)
Environmental Protection Agency	$238,067
Department of the Interior	116,323
Department of Agriculture	49,449
Atomic Energy Commission	37,629
Department of Transportation	18,168
Department of Defense	12,592
National Science Foundation	10,889
Department of Commerce	6,416
Department of Housing and Urban Development	2,623
National Aeronautics and Space Administration	1,641
Tennessee Valley Authority	777
Department of Health, Education, and Welfare	82
Total funding	$494,656

We said that, although Federal R&D programs had contributed to progress that had been made in improving the quality of some of our waterways, much remained to be done to achieve the goals of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C. 1251 et seq, Supp. IV 1974).

Need for a water pollution R&D strategy

We found that the Environmental Protection Agency (EPA) had not had an agency R&D plan setting forth goals, objectives and priorities since it was formed in December 1970. Guidance provided to agency R&D planners was broad and in the form of legislative requirements and budgetary constraints A task force established by the Administrator before the enactment of the 1972 amendments to determine their impact on EPA reported that "EPA has not adequately assessed R&D needs; has not precisely phased or quantified general objectives * * *."

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The Administrator issued a water strategy paper to implement the requirements of the 1972 amendments and to provide guidance to headquarters and regional personnel. The strategy did not include the R&D activities to be performed under the act. Efforts have been initiated by EPA to expand the strategy to include R&D activities.

EPA is envisioned as a point of central coordination and cognizance for research related to its policy, standard setting, and regulatory roles. We expressed the belief that an expanded strategy would enhance such coordination. We also said that EPA should provide the Congress with its R&D strategy and an estimate of the funding necessary to fulfill its requirements.

Coordination of Federal water pollution R&D activities not effective

For the most part, Federal water pollution R&D activities have been diverse, fragmented, and uncoordinated. As a result, inadvertent duplication and overlapping of R&D activities occurred not only between the various departments and agencies but also between bureaus and services within the same departments.

Although a multiple-agency approach to resolving water pollution problems may be advantageous and even desirable, the importance of an effective planning and coordinating mechanism increases as the costs of needed R&D exceed available resources.

No formal mechanism existed for coordinating the Federal water pollution R&D efforts among the many Federal agencies as well as non-Federal researchers.

The Office of Management and Budget (OMB) is responsible for insuring that Federal programs are properly coordinated and that appropriated funds are spent in the most economical manner with the least amount of inadvertent duplication and overlapping. OMB officials told us that their involvement was limited to general guidance and direction because of staff limitations. Similarly, the Council on Environmental Quality was also limited in coordinating Federal environmental programs.

In 1963 the Federal Council for Science and Technology established the Committee on Water Resources Research to coordinate water-related research activities of the Federal Government and to facilitate cooperation and communication between agencies. The Committee coordinated all water resources R&D and therefore could not provide the attention to adequately coordinate Federal water pollution R&D efforts. Only about 10 percent of the Committee's time was devoted to water pollution problems.

Throughout the Federal structure many interagency committees and agreements relate in some way to water pollution R&D matters. They vary extensively as to their scope, purposes, and effectiveness. None, however, provide for overall coordination of water pollution R&D activities.

Researchers told us they generally knew the other researchers and agencies working within similar areas but did not know the specific research being done. Coordination among individual researchers was through informal means (seminars, periodicals, etc.). Those responsible for planning and directing the programs had little knowledge of the nature and extent of other agencies' R&D efforts.

Officials within EPA and other Federal agencies generally agreed that water pollution R&D efforts lacked coordination not only between but also within the agencies. They also acknowledged the need for effective coordination to maximize the use of limited resources.

In addition to Federal agencies' water pollution R&D efforts, substantial R&D efforts were being undertaken by private industry, several of the States, universities, and others. Estimated R&D expenditures by non-Federal sources during fiscal year 1972 far exceeded Federal expenditures. However, no formal means existed for considering the R&D needs, priorities, and results of these non-Federal activities in planning the Federal water pollution R&D effort.

The Federal Water Pollution Control Act Amendments of 1972 directed EPA to establish National programs for preventing, reducing, and eliminating water pollution and, as part of such programs, to cooperate with Federal, State, and other public or private agencies to:

> "* * * promote the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of pollution * * *." (Underscoring supplied.)

We said that, to meet the requirements of the 1972 amendments, EPA needed to establish, in cooperation with Federal and non-Federal agencies, a national water pollution R&D plan with specific goals, objectives, and priorities. The plan should encourage an integrated, systematic, and comprehensive approach to water pollution research through the use of the water pollution R&D expertise of all Federal and non-Federal agencies and of the States, industry, and universities and should be revised and updated on a continuous basis. After the plan has been developed, EPA should actively seek the cooperation and support of other Federal agencies and non-Federal researchers in implementing it.

The need for such a plan is emphasized by the fact that the cost of needed R&D far exceeds available funds. EPA's water pollution R&D funding remained about the same during fiscal years 1969-72, and total Federal funding has increased and is expected to keep increasing. (See the following excerpt from our January 16, 1974, report.)

APPENDIX I

SUMMARY OF FEDERAL WATER POLLUTION

R&D EXPENDITURES BY AGENCY

Agency or department	Fiscal year 1969	1970	1971	1972	1973	Total
	(000 omitted)					
EPA	$49,851	$45,122	$ 52,024	$ 49,121	$41,949	$238,067
Department of the Interior:						
Bureau of Land Management	198	173	178	171	109	829
Bureau of Mines	473	651	805	1,501	-	3,430
Bureau of Reclamation	81	396	410	613	491	1,991
Bureau of Sport Fisheries and Wildlife	444	437	532	1,191	1,523	4,127
Geological Survey	6,108	7,044	8,704	9,805	10,075	41,736
Office of Saline Water	9,379	8,868	8,605	9,538	5,500	41,890
Office of Water Resoruces Research	4,235	3,545	4,124	5,178	5,238	22,320
	20,918	21,114	23,358	27,997	22,936	116,323
Department of Agriculture:						
Agricultural Research Service	3,865	4,389	7,121	8,070	7,885	31,330
Cooperative State Research Service	888	1,093	1,162	1,378	1,455	5,976
Economic Research Service	114	112	153	230	325	934
Forest Service	2,140	2,072	2,162	2,432	2,403	11,209
	7,007	7,666	10,598	12,110	12,068	49,449
Atomic Energy Commission	6,183	6,449	7,827	7,687	9,483	37,629
Department of Transportation:						
Federal Highway Administration	13	42	211	182	567	1,015
United States Coast Guard	656	2,105	3,251	5,171	5,970	17,153
	669	2,147	3,462	5,353	6,537	18,168
Department of Defense:						
Department of the Air Force	29	120	246	289	-	684
Department of the Army	-	-	463	657	-	1,120
Corps of Engineers	92	205	382	1,475	1,080	3,234
Department of the Navy	-	45	2,208	5,301	-	7,554
	121	370	3,299	7,722	1,080	12,592
National Science Foundation	915	1,239	2,803	5,932	-	10,889
Department of Commerce:						
National Oceanic and Atmospheric Administration	-	-	1,755	2,238	2,423	6,416
Department of Housing and Urban Development	479	1,171	645	310	-	2,623
National Aeronautics and Space Administration	80	138	309	1,114	-	1,641
Tennessee Valley Authority	-	-	460	317	-	777
Department of Health, Education, and Welfare	-	-	82	-	-	82
Total	$86,241	$85,416	$106,622	$119,901	$96,476	a/$494,656

a/This may not represent the total effort of these agencies as we were unable to determine exact funding levels because agencies (1) used differing terminology to classify their R&D effort or (2) did not keep detailed figures on water-pollution-related R&D in their accounting records. Fiscal year 1973 funds are estimates.

Need for better coordination of water pollution research information

Several studies have identified the need for better coordination of Federal water pollution research information. Several major Federal systems now disseminate scientific and technical information relating to water pollution.

Our review of the dissemination of water pollution research information revealed a lack of

--a central organization in the Federal Government for identifying and coordinating available information and information sources;

--technical analyses of research data to apply research results to water pollution problems;

--effort, by those groups responsible for gathering information, to identify research data users and their needs; and

--an accepted common language at the program and technical levels for categorizing, indexing, and otherwise managing and transferring technical information.

Recommendations and agency actions

We made a number of recommendations to EPA and OMB which EPA stated were constructive and would help it direct its R&D efforts toward achieving the goals of the Federal Water Pollution Control Act Amendments of 1972. OMB did not provide formal comments on our report.

We recommended that the Administrator, EPA, prepare an R&D strategy to carry out EPA's R&D requirements under the Federal Water Pollution Control Act Amendments of 1972, estimate the funding required to meet these requirements, and present this information in its annual report to the Congress.

EPA said that it basically agreed and took action to modify its R&D planning process to insure greater responsiveness to the R&D needs of its operating and regulatory programs and started preparing R&D strategies to interface with these programs.

We also recommended that the Administrator, EPA,

--develop, in cooperation with Federal and non-Federal organizations, a national plan for improved

coordination of Federal water pollution R&D and

--seek the cooperation and support of these organizations in implementing the plan.

We recommended that the Director, OMB,

--actively participate with EPA in obtaining the full cooperation of all Federal agencies engaged in water pollution R&D in the development and implementation of a national water pollution R&D plan.

EPA said that it:

"* * * does not have the resources for the development and/or the authority for a truly effective coordination of a national water pollution R&D plan or for adequate coordination of Federal research on the Great Lakes. In this regard, EPA is reluctant to undertake such endeavors without legislatively defined authority * * *."

We believe that, with the support of OMB, EPA could effectively develop and implement a national water pollution R&D plan.

We also recommended that the Director, OMB,

--designate a Federal agency as a focal point to coordinate and promote the dessemination of water pollution research results and

--establish criteria and procedures for transmitting all water pollution R&D technical reports and program information to established centers for collecting and storing this information.

EPA said that it fully supported the above recommendation but felt that such an information focal point should extend across the entire area of environmental protection and should be established within EPA. As of March 1976, OMB had not designated a Federal agency to act as a focal point.

The National Technical Information Service (NTIS) of the Department of Commerce and the Science Information Exchange (SIE) of the Smithsonian Institute agreed that a strong centrol focal point within the Federal Government for coordinating water pollution research information sources would be desirable.

AIR POLLUTION R&D

On December 11, 1975, we issued a report to the Chairman, Subcommittee on Environment, Senate Committee on Commerce, entitled "Federal Programs for Research on the Effects of Air Pollutants" (RED-76-46). We said that, although millions of dollars were spent each year by Federal agencies to evaluate and analyze effects of the Nation's air pollution, such research was not formally coordinated among the Federal agencies.

EPA's obligations for research on the effects of air pollutants on health and the environment for fiscal years 1972, 1973, and 1974 were $15.4 million, $25.1 million, and $25.3 million, respectively.

We identified six agencies within three Federal Departments, in addition to EPA, which were conducting and/or supporting research on air pollutant effects on health and the environment. As shown below, these agencies obligated about $12.6 million in fiscal year 1972, $11.5 in fiscal year 1973, and $14.7 million in fiscal year 1974 for such research.

	Funds obligated		
	FY 1972	FY 1973	FY 1974
Department of Health, Education, and Welfare:			
National Institutes of Health:			
National Institute of Environmental Health Sciences	$ 3,214,031	$ 3,005,660	$ 4,612,103
National Heart and Lung Institute	1,041,087	1,113,421	1,927,095
National Cancer Institute	217,655	67,754	131,803
National Institute of Occupational Safety and Health	1,248,355	750,398	1,013,512
	5,721,128	4,937,233	7,684,513
Department of Transportation:			
Climatic Impact Assessment Program	6,586,400	5,703,800	5,874,715
Department of Commerce:			
National Oceanic and Atmospheric Administration	339,000	816,673	1,110,200
Total	$12,646,528	$11,457,706	$14,669,428

APPENDIX I

Private industry's research into air pollutant effects has been very limited. Its research was concerned mainly with measuring, monitoring, and controlling air pollutants.

Need for improved coordination of Federal air pollution research programs

The Clean Air Act, as amended (42 U.S.C. 1857 et seq) directs the Administrator, EPA to:

> "* * * promote the coordination and acceleration of research investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention and control of air pollution * * *."

We found that EPA had taken little action to promote coordination of research and had no written policies, procedures, or regulations for coordination. Although air pollution research was not formally coordinated among the Federal agencies, some coordination occurred on a scientist-to-scientist basis and through meetings of various committees.

Our review showed that there was some coordination among individual researchers on an informal basis (seminars, periodicals) and that those responsible for planning and directing the programs had little knowledge of the nature and extent of other research. We noted several instances in which EPA scientists were unaware of research similar to their own which was being funded by other Federal agencies We expressed the belief that a certain amount of planned redundancy might be beneficial in that different approaches to the same problems may result in a variety of solutions, one perhaps being more efficient than the other. However, when the redundancy is unplanned, unnecessary duplication and inefficiency can occur. This becomes even more of a problem when the costs of needed research exceeds available resources.

Throughout the Federal structure, many interagency committees and agreements relate in some way to research on effects of air pollutants. The interagency committees and agreements vary extensively as to their scope and purposes. None, however, provide for overall coordination of air pollution effects research activities.

EPA participates in committees and meetings sponsored by other Federal agencies conducting air pollution research. The scientists also informally discuss research with non-EPA scientists. Although the meetings provide a means of exchanging information, an official of the National Heart and Lung

Institute said the meetings contributed little to the overall coordination of air pollution effects research.

Officials within EPA and the National Institute of Occupational Safety and Health agreed in general that air pollution programs were not adequately coordinated between agencies. They also acknowledged the need for effective coordination to maximize the use of limited resources.

No central point for disseminating research information

There has been no assurance that a potential user can become aware of all completed and ongoing research in his area of interest. To maximize use of research accomplishments, the reports of research results must be made available and must be in a form that encourages using the information.

Several major Federal systems now disseminate scientific and technical information on air pollution effects. Currently there is no one central information source on Federal air pollution research. None of the existing information systems are complete or comprehensive in coverage. SIE collects data on active research only, whereas NTIS is concerned only with reports of completed research. Also agencies are not required to submit reports to NTIS for dissemination. Agency officials told us they made limited use of SIE and NTIS because the data was incomplete and not current.

We expressed the belief that more coordinated research programs, including a more systematic method to disseminate research information on air pollutants among all Federal agencies, would improve the information base for regulatory actions.

Recommendations

We recommended that the Administrator, EPA, develop written policies and regulations that would enable EPA to fulfill its responsibility to coordinate research under the Clean Air Act. One possibility might be to establish a clearing house operation located within EPA that would be aware of all ongoing air pollution effects research funded by the Federal Government and to more actively seek input of research results from other Federal agencies for the Air Pollution Technical Information Center.

In a letter dated October 24, 1975, EPA made the following statement with regard to research coordination under the Clean Air Act:

"* * * there are at least three coordinating efforts in progress. They are (1) joint sponsorship of work at the National Center for Toxicological Research involving lower level long time exposure to toxicants, (2) Inter- and Intra-agency Committee work with HEW on Carcinogenicity and Toxicity and (3) joint studies with HUD, ERDA and NBS on indoor air pollution studies. Research is also being coordinated through the Interdepartmental Committee for Atmospheric Sciences. In addition to EPA, members include the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the Department of Defense as well as several other Departments and Agencies."

Our review of EPA's coordination activities included examining the activities described above. We noted several instances in which EPA scientists were unaware of research similar to their own which was being funded by other Federal agencies. We therefore believe that EPA needs to take futher action to enable it to fulfill its responsibilities to coordinate research under the Clean Air Act.

PESTICIDES R&D

Federal pesticide-related R&D activities are being conducted and/or supported by six departments and independent agencies. EPA has the primary role in research on the effects of pesticides, whereas the Department of Agriculture has the primary role in pest control research.

The following table shows the amount of Federal funding for fiscal years 1971-73 for each Federal agency conducting pesticide-related R&D.

Department or agency	FY 1971	1972	1973	Total
		(000 omitted)		
Department of Agriculture	$ 78,002	$ 93,376	$ 95,789	$267,167
EPA	6,313	9,487	9,518	25,318
Department of Health, Education, and Welfare	7,405	7,430	7,767	22,602
Department of the Interior	5,127	5,604	5,472	16,203
National Science Foundation	1,045	2,265	3,088	6,398
Department of Defense	2,271	2,548	1,444	6,263
Total	$100,163	$120,710	$123,078	$343,951

APPENDIX I

The Federal Working Group on Pest Management, which is responsible to the Council on Environmental Quality, is the primary staff level coordinating mechanism for Federal activities concerning pesticides, pests, and pest management. The Working Group has established a research panel to review and coordinate the numerous Federal efforts on pest control and pesticide research and to determine needed research.

Panel membership is composed of officials from various Federal agencies concerned with pesticides, pests, and pest management.

The panel, however, was mainly concerned with the ecological effects of pesticides and did not concern itself with the health effects. Further, because agencies were not required to respond to the panel's recommendations, the panel was not aware in most instances of what actions, if any, agencies took as a result of its recommendations.

In March 1976 a Council on Environmental Quality official told us that the Council was reviewing the charter of the Working Group to determine what the role of the Working Group should be.

NOISE R&D

Our work in the area of noise R&D is only in the preliminary stages, and therefore we have not reached conclusions as to the adequacy of EPA's coordination of Federal noise research.

The Noise Control Act of 1972 (42 U.S.C. 4901 et seq, Supp. III 1973) represents the first comprehensive noise control legislation in the country's history. Under this act, the Administrator, EPA, is required to

--develop and publish information about permissible levels of noise,

--set standards for products that have been identified as major sources of noise,

--develop information on techniques for controlling noise, and

--coordinate all Federal programs relating to noise research and noise control.

To comply with the requirement to coordinate all programs of the Federal Government relating to noise research, EPA in early 1974 established the following groups that

are supposed to coordinate Federal noise R&D efforts.

1. An interagency noise research committee.

2. Four interagency noise research panels in the areas of aircraft, surface vehicles, stationary machinery, and noise effects.

3. Ad hoc working groups for specific problems on noise.

The need to coordinate the noise R&D activities in the Federal Government is evidenced by the fact that 11 Federal agencies and departments are conducting such research. They are the National Aeronautics and Space Administration; National Science Foundation; National Bureau of Standards in the Department of Commerce; Consumer Product Safety Commission; EPA; and the Departments of Transportation; Defense; Interior; Agriculture; Housing and Urban Development; and Health, Education, and Welfare. The area of involvement of each of these agencies and departments and their expenditures during fiscal years 1973, 1974, and 1975 are shown below.

APPENDIX I

AGENCY INVOLVEMENT

Agency	Aircraft	Surface Vehicles	Stationary Machinery	Noise Effects
NASA	x			x
DOT	x	x		x
HEW			x	x
DOD	x	x	x	x
NSF		x	x	x
DOI			x	x
DOC/NBS			x	x
USDA		x	x	
CPSC			x	
HUD				x
EPA	x	x	x	x

FEDERAL EXPENDITURES FOR NOISE RESEARCH
FY FUNDING (000 omitted)

Agency	1973	1974	1975
NASA	$ 46,407	$ 47,232	$ 28,504
DOT	13,767	5,269	3,467
HEW	1,090	1,613	2,015
DOD	3,897	4,621	3,063
NSF	263	658	--
DOI	409	551	730
DOC/NBS	236	381	407
USDA	4	93	131
CPSC	--	70	--
HUD	117	638	460
EPA	453	1,189	490
TOTALS	$ 66,643	$ 62,315	$ 39,186 (sic)

"First Report on Status and Progress of Noise Research and Control Programs in the Federal Government," EPA 550/9-75-023, June 1975, vol. 1, p. 2-8.

SOLID WASTE R&D

Our work in the solid waste area is in the preliminary stages and has not progressed far enough for us to reach conclusions on the adequacy of coordination among Federal agencies.

The major thrust of the solid waste R&D program includes the preparation of comprehensive documents on the effects of solid waste which are designed to support (1) development of a regulatory program for the treatment and disposal of pesticides and other toxic chemicals, (2) investigations to determine the potential for migration through soils of hazardous industrial wastes, (3) studies to evaluate the environmental effects of sanitary landfills, and (4) the development of resource recovery systems.

A resource recovery program has been established to develop economical techniques for producing usable and marketable products by:

--Identifying, testing, and developing candidate waste materials for use in the building and other industries.

--Identifying the role of waste reuse in minimizing shortages of critical material.

In fiscal years 1974 and 1975, EPA obligated $4.7 million and $5.1 million, respectively, for solid waste R&D. The estimate for fiscal years 1976 and 1977 is $4.1 million each.

In addition to EPA, several other Federal agencies are or have been involved in solid waste R&D. The Office of Conservation, Energy Research and Development Administration received its first appropriation of $1 million in fiscal year 1976 to conduct research on the recovery of energy from solid waste. In addition, $500,000 was transferred to ERDA from the National Science Foundation for a project to produce methane gas from urban solid waste.

The Department of Agriculture also conducts research related to agricultural solid waste. During fiscal years 1974 and 1975 the Department expended about $10.6 million and $10.9 million, respectively, on solid waste R&D and has budgeted about $13.9 million for fiscal year 1976.