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FOREWORD

On August 1, 1972, the United States General Accounting Office (GAO) issued "Standards for Audit of Governmental Organizations, Programs, Activities & Functions." These standards were developed for application at all levels of government in the United States.

OBJECTIVE OF GAO STANDARDS

A principal objective of the GAO standards is to stimulate State and local governments to improve the character and scope of audits¹ of federally assisted programs. It is generally agreed that the Federal Government should rely, to the extent practicable, on audits undertaken by State and local governments to eliminate the duplicate audit coverage that results when Federal, State, and local auditors independently audit programs and activities without regard to the needs of the other levels of government.

RELATIONSHIP OF GAO STANDARDS TO AICPA STANDARDS

Because many State and local governments engage independent public accountants to audit their activities, the GAO standards have been of great interest to the public accounting profession. The scope and expected results of the audits contemplated in the GAO standards are perhaps the areas of greatest interest.

Some members of the public accounting profession have asked why GAO considered it necessary to publish auditing standards when the American Institute of Certified Public Accountants (AICPA) has had widely accepted auditing standards for many years and has a committee continually considering this subject.

For audits of financial statements, the AICPA standards were incorporated in the GAO standards. However, the GAO standards are broader and were developed primarily to cover additional areas of interest to government officials, legislators, and the public, as explained below.

¹The term "audit" or "auditing" is used in this report in the sense in which it encompasses the examination of financial operations and legal compliance, the review of economy and efficiency, and the review of program results.

AICPA cooperated in the development of the GAO standards. In November 1973 AICPA published "Auditing Standards Established by the GAO--Their Meaning and Significance for CPAs" which contained the following comment.

"The Members of this Committee [AICPA Committee on Relations with the General Accounting Office] agree with the philosophy and objectives advocated by the GAO in its standards and believe that the GAO's broadened definition of auditing is a logical and worthwhile continuation of the evolution and growth of the auditing discipline."

BROAD SCOPE AUDITS NEEDED FOR GOVERNMENT PROGRAMS

The objectives of governmental programs and activities are varied, dealing generally with promoting citizens' safety, health, and welfare. Therefore, measures of the effectiveness of government activities must focus on what the programs are intended to achieve and what they actually achieve with the resources used.

Moreover, since such programs are financed with taxpayers' funds, there is an accompanying need to know whether funds are properly safeguarded from loss, laws and regulations governing the use of these funds are followed, and those spending the funds achieved reasonable efficiency and economy in carrying out their work.

Responsible government officials must be held accountable in all of these areas. GAO's auditing standards therefore provide for audits of a broad scope, consisting of the following elements:

1. Financial and compliance--determines (a) whether financial operations are properly conducted, (b) whether the financial reports of an audited entity are presented fairly, and (c) whether the entity has complied with applicable laws and regulations.
2. Economy and efficiency--determines whether the entity is managing or utilizing its resources (personnel, property, space, and so forth) in an economical and efficient manner and the causes of any inefficiencies or uneconomical practices, including inadequacies in management information systems, administrative procedures, or organizational structure.

- 4
3. Program results--determines whether the desired results or benefits are being achieved, whether the objectives established by the legislature or other authorizing body are being met, and whether the agency has considered alternatives which might yield desired results at a lower cost.

AVOIDANCE OF DUPLICATION IN AUDITING

As the Federal Government makes more funds available to State and local governments through specific-purpose grants and revenue sharing, its goals and objectives become more closely related to those of State and local governments. Local government officials and legislators want to know what particular programs are achieving at the local level; State officials and legislators want to know what these same programs are achieving on a State-wide basis; and Federal officials and the Congress want such information on a national basis. Citizens are interested in what is happening at all levels.

If an audit is to be made of a particular grant or similar activity in which more than one level of government is interested, it should be made with appropriate standards so the result will be useful to all interested parties. Such an approach should not only save the costs inherent in duplicate auditing but also make the examination and review processes more effective by making it possible for the auditor to gain a more complete understanding of the program he is auditing.

PURPOSE OF THIS ILLUSTRATIVE AUDIT

This illustrative audit was undertaken to demonstrate one type of situation where an audit of a local governmental activity could provide information needed at the local level and also deal with questions and issues of interest to the State and Federal levels of government.

This example is based on an audit made by a GAO regional office of the Air Pollution Control Program jointly funded by a local government and the Environmental Protection Agency (EPA). Because the audit is being used for illustrative purposes and the report will receive wide distribution, we have used a fictitious name for the local government audited.

The reporting concepts illustrated in this example are different from those commonly used by public accounting firms and most governmental audit organizations. This reporting approach is based on the assumption that the Federal agency furnished an audit guide to the grantee (the county) who contracted with the public accounting firm and that the public accounting firm was required to report

back to the grantee, the State and the Federal agency the information developed and conclusions reached, if applicable, on each of the areas covered in the audit guide. Following this approach, both the program managers and auditors at the Federal level can consider the combined results of independent audits at several locations and thus gain a broader view of how the program is being carried out.

We do not contemplate that local governments would make audits of this scale annually for programs such as the Air Pollution Control Program. Auditing such programs on a 3- or 5-year cycle or performing audits of the programs of statistically selected State and local governments may be the better way of obtaining necessary information on many national programs.

Although auditors normally do not include the audit guidelines with their report or cross-reference their comments in the report to the audit guidelines, we have done so in this instance so that auditors and managers can relate the comments in the report with the audit guidelines used.

The design of reports on audits which cover examinations of financial operations and compliance with applicable laws and regulations, reviews of efficiency and economy of operations, and reviews of program results is a relatively new undertaking. This is particularly true where an audit at the local level is made--the results of which will be of interest to officials at that level as well as at State and Federal levels. Developing reporting techniques in this area will be an evolutionary process. This report is a start. GAO intends to publish other examples showing other approaches.

This report demonstrates the type of reporting contemplated by the GAO standards when programs at the local government level are to be audited according to Federal guidelines. GAO prepared the audit guidelines used (appendix I) after consulting EPA officials.



Comptroller General
of the United States

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ILLUSTRATIVE REPORT

AIR POLLUTION CONTROL PROGRAM

SASSAFRAS COUNTY

MARYLAND



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

March 31, 1974

The County Council
Sassafras County, Maryland

Ladies and Gentlemen:

This report presents the results of our audit of the Sassafras County, Maryland, Air Pollution Control Program. Our audit was made in accordance with the GAO Standards for Audit of Governmental Organizations, Programs, Activities & Functions and included:

1. An examination of financial operations and legal compliance matters for the period from July 1, 1972, to June 30, 1973. (At the time of our audit, a local air pollution control ordinance had not been enacted and the transportation strategies required in the Maryland State Implementation Plan of 1973 had not been approved by the Environmental Protection Agency (EPA). Therefore, our review of the county's compliance with applicable laws and regulations was directed primarily to compliance with EPA regulations and grant requirements.)
2. A review of efficiency and economy of operations for the period from July 1, 1972, to December 31, 1973.
3. A review of program results for the period from July 1, 1972, to December 31, 1973.

Our audit included a study of (1) the county's applications for Federal grants under the Air Pollution Control Program, (2) the approved grants and expenditures associated with such grants, (3) the county's financial reports for the program for the fiscal year ended June 30, 1973, and reports of operations for the 18-month period ended December 31, 1973, (4) the Maryland State Implementation Plan of

1973, and (5) such other data considered necessary in the circumstances. We interviewed officials of the county's Air Pollution Control Section and Finance Department, the Maryland Bureau of Air Quality Control, the Metropolitan Council of Governments, and EPA.

The results of our audit are presented in the following chapters. (For ease of reference, sections of the report are numbered to correspond with the pertinent sections of the audit guidelines. See app. I.)

BACKGROUND

Under the 1967 Air Quality Act and the Clean Air Act of 1970, the Congress provided for technical and financial assistance for air pollution prevention and control programs at the State and local governmental levels. The Congress believes these levels of government should be responsible primarily for preventing and controlling air pollution at the sources, except for sources attributed to new motor vehicles for which the Federal Government has primary pollution control responsibility.

Since June 1968 Sassafras County has received Federal assistance from EPA to partially finance an Air Pollution Control Program which is part of the Maryland State Implementation Plan.

FINANCIAL OPERATIONS AND LEGAL COMPLIANCE

The annual report of expenditures we examined was for the fiscal year ended June 30, 1973. Our opinion thereon, which appears on page 11, is qualified to the extent that the salaries for certain personnel were charged to the program, even though the employees involved devoted part of their time to activities other than air pollution control. We estimate that such expenditures charged to the program for the fiscal year ended June 30, 1973, approximated \$1,900; about \$1,200 was reimbursed under the EPA grant. A determination as to whether

these costs will be allowable or unallowable under the grant must be made by EPA.

Because the grant stipulated that the people filling air pollution control positions would spend 100 percent of their time on air pollution activities, we recommended--and the county Director of Environmental Resources agreed--that the procedures should be revised so that the program would be charged only for the time personnel worked on it.

With respect to the county's compliance with applicable local, State, and Federal air pollution control laws, we found that:

1. At the time of our audit there were no local air pollution control laws, although a proposed local ordinance was then being considered by the County Council.
2. EPA had not approved the transportation control strategies required in the Maryland State Implementation Plan.
3. Sassafras County had complied with EPA's specified means of collecting and analyzing air samples except for a spectrophotometer which was different from the one EPA specified. The difference would have no significant impact on the quality of sample analyses.

ECONOMY AND EFFICIENCY

There are items of equipment on hand worth \$6,700 which are no longer needed or being used by the county. (See p. 21.) We are recommending that EPA consider whether the equipment could be used by some other grantee.

PROGRAM RESULTS

The county substantially achieved the intermediate abatement objectives set forth in the 1973 EPA grant, with the following exceptions.

1. According to the grant, the county was supposed to establish a program for controlling particulates from construction and material handling. Air pollution control officials said such a program had not been established because of a lack of agreement on the responsibilities of other county units, such as the Police Department and the Department of Public Works. (See p. 31.)

We recommend that the Council, while considering the county's proposed air pollution control ordinance, define clearly the responsibilities of the county units for enforcing the ordinance.

2. The county public school system must convert all of its school facilities from residual fuel oil or install particulate-capturing equipment by October 1, 1974. As of March 31, 1974, the school system had not submitted a plan for compliance despite requests from the Air Pollution Control Section. (See p. 31.)

We recommend that the Council require the Superintendent of Schools to submit a fuel conversion plan as requested by the Air Pollution Control Section.

The emission inventories show that the county made some progress during 1973 in controlling particulates. However, carbon monoxide and photochemical oxidants levels in Sassafras county apparently are the major problems; the national air standards for carbon monoxide and photochemical oxidants are being exceeded at an increasing rate. (See pp. 37 to 39.)

These pollutants exceeded EPA air quality standards on 86 days during the 18-month period reviewed. The 1975 national air quality standards provide that applicable levels not be exceeded more than once a year for each pollutant.

Motor vehicles are the primary sources of carbon monoxide and photochemical oxidants, but the county exercises almost no control over that source of air pollution. The Federal Government is responsible for controlling pollution from new mobile sources, and the State is responsible for inspecting air pollution control devices on cars registered in Sassafra County.

The following conditions were observed with regard to the county's air pollution control activities.

1. Although the county had acquired EPA-specified air monitoring equipment which was in good working condition at the time of our audit, no samples were taken during significant periods in the 18-month period covered by our audit. (See p. 39.) County and State officials should closely examine this situation.
2. The county's report of operations for the program was inaccurate because it was incorrectly prepared and the Air Pollution Control Supervisor did not adequately review it. As a result, the number of times the air quality standards were exceeded was not accurately reported. County records showed 127 instances in which the standards were exceeded but not reported during the 18-month period. (See p. 39 to 41.) We brought this to the attention of the supervisor who agreed with our findings and promised that, in the future, the reports would be verified and reviewed more carefully to be sure that they are accurate.
3. Air pollution episode plans were not implemented in all cases when the levels of pollutants exceeded the minimum health requirements. When episode plans were implemented, the primary (often the only)

action taken was to warn the public of the danger. In general, available data indicates that the public did not respond to such warnings. (See p. 43.)

The Air Pollution Control Supervisor and the Director of Environmental Resources of Sassafras County and the Director of Audits, EPA, have reviewed this report. Their comments and suggested clarifications are included in the report.

In accordance with the memorandum of audit agreement, we are sending copies of this report to the Maryland State Department of Health and Mental Hygiene and to the Administrator, EPA.

Regional Manager
U.S. General Accounting Office



UNITED STATES GENERAL ACCOUNTING OFFICE

WASHINGTON, D.C. 20548

March 31, 1974

Administrator, Environmental
Protection Agency

Dear Sir:

Enclosed is a copy of our report to the County Council on the results of our audit of the Sassafras County, Maryland, Air Pollution Control Program. Our audit was made in accordance with the GAO Standards for Audit of Governmental Organizations, Programs, Activities & Functions.

We are forwarding this report to you because of your interest and responsibilities in this area. Your attention is invited particularly to pages 21 and 32 which contain recommendations to the Environmental Protection Agency.

A copy of the audit report is also being sent to the Director, Bureau of Air Quality Control, Environmental Health Administration, Maryland State Department of Health and Mental Hygiene.

Sincerely yours,

Regional Manager
U.S. General Accounting Office



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

March 31, 1974

Director, Bureau of
Air Quality Control
Environmental Health Administration
Maryland State Department of
Health and Mental Hygiene
Baltimore, Maryland

Dear Sir:

Enclosed is a copy of our report to the County Council on the results of our audit of the Sassafras County, Maryland, Air Pollution Control Program. Our audit was made in accordance with the GAO Standards for Audit of Governmental Organizations, Programs, Activities & Functions.

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A copy of the audit report is also being sent to the Administrator, Environmental Protection Agency.

Sincerely yours,

Regional Manager
U.S. General Accounting Office

REPORT ON AUDIT

AIR POLLUTION CONTROL PROGRAM

SASSAFRAS COUNTY,

MARYLAND

1. Examination of financial operations and legal compliance matters for the period from July 1, 1972, to June 30, 1973.
2. Review of economy and efficiency of operations for the period from July 1, 1972, to December 31, 1973.
3. Review of program results for the period from July 1, 1972, to December 31, 1973.

U.S. GENERAL ACCOUNTING OFFICE

CHAPTER 1

FINANCIAL OPERATIONS AND LEGAL COMPLIANCE

A. OPINION ON FINANCIAL REPORT

Our examination of the annual report of expenditures of the county's Air Pollution Control Program for Grant No. 73A-3201-R2 for July 1, 1972, to June 30, 1973 (see p. 12), was made in accordance with generally accepted auditing standards,¹ and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

During this period, salaries of certain personnel were charged to the program, even though the employees involved devoted part of their time to other activities. Such expenditures charged to the program for the fiscal year ended June 30, 1973, approximated \$1,900; approximately \$1,200 was reimbursed under the Environmental Protection Agency (EPA) grant. EPA must determine whether these costs will be allowable or unallowable under the grant.²

In our opinion, except for the matter described in the preceding paragraph, the following annual report of expenditures presents fairly the expenditures of the county's Air Pollution Control Program under Grant No. 73A-3201-R2 for the period from July 1, 1972, to June 30, 1973, in conformity with the finan-

¹Generally accepted auditing standards and the "Standards for Audit of Governmental Organizations, Programs, Activities & Functions" are the same insofar as examinations of financial statements are concerned; accordingly, either may be cited when giving opinions on financial statements.

²In the event numerous costs are questioned, the middle paragraph could be reworded to incorporate by reference a separate schedule of all the questioned costs.

				DO NOT WRITE IN THIS SPACE	
ANNUAL REPORT OF EXPENDITURES AIR POLLUTION CONTROL PROGRAM PROJECT GRANT				1. GRANT NUMBER 73A-3201-R2	
2. NAME AND ADDRESS OF GRANTEE AGENCY SASSAFRAS COUNTY HEALTH DEPARTMENT COUNTY OFFICE BUILDING SALZVILLE, MD 20850				3. PROJECT PERIOD FROM 7/1/72 THROUGH 6/30/73 4. BUDGET PERIOD COVERED BY THIS REP. FROM 7/1/72 THROUGH 6/30/73	
RECEIPTS	5. FEDERAL PROJECT FUNDS AVAILABLE FOR BUDGET PERIOD			\$ 140,000.00	
	6. ELIGIBLE NON-RECURRENT NON-FEDERAL PROJECT FUNDS AVAILABLE FOR BUDGET PERIOD			\$ 115,566.00	
	7. OTHER THAN NON-RECURRENT NON-FEDERAL PROJECT FUNDS AVAILABLE FOR BUDGET PERIOD			\$	
	8. TOTAL NON-FEDERAL PROJECT FUNDS AVAILABLE FOR BUDGET PERIOD			\$ 115,566.00	
	9. TOTAL RECEIPTS AVAILABLE FOR PROJECT EXPENDITURE			\$ 255,566.00	
10. INTEREST EARNED ON FEDERAL FUNDS			\$		
PROJECT EXPENDITURES FOR PERIOD SHOWN IN ITEM 4					
BUDGET CATEGORY	NON-FEDERAL PROJECT FUNDS			FEDERAL PROJECT FUNDS	TOTAL PROJECT FUNDS
	ELIGIBLE NON-RECURRENT	OTHER THAN NON-RECURRENT	TOTAL		
11. PERSONNEL	\$	\$ 72,130.00	\$ 72,130.00	\$ 117,338.00	\$ 189,468.00
12. EQUIPMENT		729.00	729.00		729.00
13. SUPPLIES		5,263.00	5,263.00		5,263.00
14. TRAVEL		11,251.00	11,251.00		11,251.00
15. CONSULTATION & SERVICES		3,280.00	3,280.00		3,280.00
16. ALTERATIONS & RENOVATIONS		104.00	104.00		104.00
17. TUITION					
18. PUBLICATION COSTS					
19. OTHER		12,438.00	12,438.00		12,438.00
20. TOTAL	\$	\$ 105,195.00	\$ 105,195.00	\$ 117,338.00	\$ 222,533.00
TOTAL PROGRAM EXPENDITURES FOR PERIOD SHOWN IN ITEM 4					
BUDGET CATEGORY	PROGRAM EXCLUSIVE OF PROJECT			TOTAL PROJECT FUNDS	TOTAL PROGRAM FUNDS
	NON-RECURRENT	OTHER THAN NON-RECURRENT	TOTAL		
21. PERSONNEL	\$	\$	\$	\$ 189,468.00	\$ 189,468.00
22. EQUIPMENT				729.00	729.00
23. SUPPLIES				5,263.00	5,263.00
24. TRAVEL				11,251.00	11,251.00
25. CONSULTATION & SERVICES				3,280.00	3,280.00
26. ALTERATIONS & RENOVATIONS				104.00	104.00
27. TUITION					
28. PUBLICATION COSTS					
29. OTHER				12,438.00	12,438.00
30. TOTAL	\$	\$	\$	\$ 222,533.00	\$ 222,533.00
				\$ 22,662.00	\$ 22,662.00
31. FEDERAL PROJECT FUNDS					
32. ELIGIBLE NON-RECURRENT NON-FEDERAL PROJECT FUNDS					
33. OTHER THAN NON-RECURRENT NON-FEDERAL PROJECT FUNDS				\$ 10,371.00	
34. TOTAL NON-FEDERAL PROJECT FUNDS					\$ 10,371.00
35. TOTAL UNOBLIGATED BALANCES-PROJECT					\$ 33,033.00
36. CERTIFICATION: I certify that this report is true and correct to the best of my knowledge, and that all expenditures and obligations reported herein have been made in accordance with the regulations governing grants (42 C.F.R. Part 56, as revised) and with terms and conditions of the grant awarded.			CERTIFICATION: I certify that the expenditures and obligations listed in this report were made with my approval.		
SIGNATURE OF FINANCIAL OR OTHER CERTIFYING OFFICER			SIGNATURE OF AGENCY DIRECTOR		
NAME AND TITLE OF CERTIFYING OFFICER (TYPED) Director of Finance			NAME OF AGENCY DIRECTOR (TYPED) County Health Officer		
DATE			DATE		

cial provisions of the grant. (Financial provisions of the grant are indicated in audit guidelines, section II-B, pp. 45 to 47.)

Other audit coverage

The county's financial statements for the fiscal year ended June 30, 1973, had been audited by a firm of certified public accountants (CPAs). In its report to the County Council, the auditors expressed their opinion that the financial statements presented fairly the financial position of the various county funds at June 30, 1973, and the results of their operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

In our audit of the Air Pollution Control Program, we considered the scope of the CPA's audit and relied on the CPA's evaluation of the county's overall system of internal controls and its tests of the county's compliance with general ordinances and State laws.

Although the county has an internal audit staff, no internal audits had been made of air pollution control activities.

B. COMPLIANCE

With respect to the county's compliance with applicable local and State air pollution control laws, we found that:

1. At the time of our audit, a Sassafras County air pollution ordinance had not been passed; the County Council was considering a proposed ordinance.
2. EPA has not yet approved the transportation control strategy proposed by the State of Maryland.

Consequently, our compliance examination was directed primarily to checking the county's compliance with EPA's regulations contained in the grant for the period July 1, 1972, to June 30, 1973. We found no instances of the county's failure to comply with such terms and conditions, except as discussed in subsection 5 below. Our comments and observations on compliance matters follow.

3. Submission of expenditure report

The county submitted its annual expenditure report for the fiscal year ended June 30, 1973, on September 11, 1973, within the required 90 days after the end of the budget period. The report included supplemental schedules of project expenditures by budget category, as required.

4. Plan of scheduled activities submitted

On November 24, 1972, the county submitted to EPA a plan detailing the mutual responsibilities and scheduled activities of the county and the Maryland Bureau of Air Quality Control for the fiscal year ended June 30, 1973, as required.

5. Propriety of expenditures

In our opinion, Federal and non-Federal air pollution program funds were used for the purposes stated in the grant application and for those items in the approved budget, except for the matter discussed on pages 24 and 25, of paying program personnel for time devoted to activities other than air pollution control during the fiscal year ended June 30, 1973. On the basis of our recommendation, the county agreed to revise its procedures to insure that personnel costs are properly charged in subsequent fiscal years to the activities for which the personnel's time is spent.

6. Accounting cutoffs

In our opinion, proper accounting cutoffs and accruals of expenses were made at the end of the fiscal years ended June 30, 1972 and 1973, so that program funds were spent or obligated only during the period of the grant award.

7. Use of program funds

The county made no budget changes requiring prior EPA approval. Comments on specific items requested in the audit guide follow.

- a. For the fiscal year ended June 30, 1973, county records show that there were no transfers of non-Federal funds which substantially altered the scope or purpose of the grant award.
- b. County records also indicate that expenditures of Federal funds did not result in a cumulative increase in the total of any budget category of more than 25 percent, or \$1,000.
- c. The county spent no Federal funds in a budget category other than those approved in the grant, and it did not buy equipment items costing more than \$1,000 each.

8. Federal reimbursement

The county obtained and spent the necessary non-Federal funds for the grant period so that appropriate matching ratio requirements were met.

Total program expenditures for the fiscal year ended June 30, 1973, were \$222,533, as shown by the accompanying financial

report. Pursuant to grant regulations (42 CFR 45 56.5 g), only non-Federal funds exceeding the previous year's non-Federal funds may be matched at a 3 to 1 ratio.

In the fiscal year ended June 30, 1972, the county's non-Federal costs (unaudited by GAO) were \$66,082. The county's (non-Federal) costs in the fiscal year ended June 30, 1973, were \$105,195. Applying the 3 to 1 ratio to the additional \$39,113 in non-Federal funds, the appropriate Federal share was \$117,338. A summary follows.

Non-Federal funds - 1973	\$105,195
Non-Federal funds - 1972	<u>66,082</u>
Additional non-Federal funds	39,113
Matching 3 to 1 ratio	<u>3</u>
Appropriate Federal share	^a <u>\$117,338</u>

^aMinor difference due to rounding.

9. Records of financial status

Monthly cumulative reports show the total cost of the activity and the amount by budget category supplied from Federal and non-Federal sources.

10. County complied with methods of measuring air quality specified by EPA

a. We discussed the county's methods for monitoring and analyzing air quality with officials of the Maryland Bureau of Air Quality Control and the Quality Control Branch, Office of Air Monitoring, EPA. On the basis of our discussions, we believe the county was using EPA-specified methods to measure all pollutants.

- b. Officials of both the Air Pollution Control Section and the Maryland Bureau of Air Quality Control told us that no formal Maryland State evaluation had been made of the county's air monitoring and analysis methods before our review. According to these officials, however, Maryland does review and approve each fiscal grant application containing a detailed explanation of air monitoring and analysis methods. Although the State's review of and comments on the county air monitoring and analysis methods contained in the grant application is beneficial to EPA, a periodic inspection and report would be more reliable. State officials indicated such a procedure would be incorporated into a new State review system.
- c. The county used a spectrophotometer in laboratory analyses which was different from that recommended by EPA. According to county records, it would have cost \$2,800 to purchase a new spectrophotometer with the recommended band width.
- d. We brought this to the attention of EPA air monitoring officials who told us that the difference in band width between the two spectrophotometers would not have a major impact on the quality of sample analyses.
- e. The county measures all pollutants for which EPA has established primary and secondary standards, except hydrocarbons. Maryland monitors hydrocarbons at two county locations as a part of the Maryland-wide air quality monitoring system and furnishes data on hydrocarbon measurements to the county. In our opinion, this arrangement is acceptable

until the county obtains a hydrocarbon monitor.

- f. The county has budgeted funds for a total hydrocarbon methane air monitor but has not purchased this equipment. It is awaiting an EPA determination as to the equipment that will best serve this purpose; it then plans to request approval. This is as required by the approved grant.

CHAPTER 2

ECONOMY AND EFFICIENCY

A. EQUIPMENT AND SUPPLIES

1. Procedures for purchase of equipment and supplies

We interviewed county officials and examined equipment requisitions, purchase orders, receiving slips, and equipment inventory cards to determine the procedures followed to purchase equipment and supplies.

Equipment and supply needs are usually determined during the year, and necessary funds are requested in the budget for the next year. The Director, Division of Resources Protection, and the Director, Department of Environmental Protection, review the budget for need, technical merit, and resource availability. If unbudgeted equipment and supply needs arise during the fiscal year, the review procedure remains the same.

We noted no instances when unneeded equipment and supplies were purchased and concluded that these procedures were satisfactory.

2. Obtaining economical prices

We interviewed personnel in the Air Pollution Control Section and other county officials and reviewed their records to determine if procedures existed for purchasing equipment and supplies at economical prices.

The county purchasing division purchases all equipment and supplies. For purchases over \$2,000, competitive bids are solicited. The department director must justify to the county purchasing director reasons for not selecting the lowest bidder. The purchasing director told us that deadlocks, although rare, are resolved by the county attorney.

On the basis of personal experience and knowledge of local vendors, an air pollution control official recommends vendors for smaller items of equipment and supplies peculiar to air pollution. A county official said that a stock of the more common items was maintained to take advantage of quantity discounts.

The county's procedures appeared adequate for purchasing equipment and supplies at economical prices.

3. Equipment records

The supervisor of the Air Pollution Control Section keeps an equipment and supply "Kardex" file for all equipment and supplies the section purchases. At the time of our audit, equipment inventory was valued at about \$40,000.

Card files include such information as the dates received, costs, vendors, purchase order numbers, and serial numbers. Copies of requisitions are also on file. We tested the accuracy of these records and found no major errors.

4. No excess supplies

The Air Pollution Control Section uses about \$450 worth of supplies a month, \$250 of which is for chemicals and laboratory supplies. The value of inventory on hand was about \$1,100.

We compared monthly use rates with the stock of supplies on hand and concluded that supplies on hand were not excessive. Items usable only for air pollution purposes were ordered when needed.

5. Equipment condition and usage

Using the equipment records as a base, we verified the existence and condition of selected items of air pollution control equipment and found all to be in good condition. The semiannual report for the first 6 months of fiscal year 1974 indicated,

however, significant outages for three continuous monitors.

To determine if the equipment was being used, we examined summary sheets and log books used for readings and calibrations of equipment, observed the equipment in use, and discussed with its operator the purposes of each item.

Our analysis of air monitoring records showed significant periods when the equipment was not functioning. (See p. 39.) Although the equipment was in good working condition at the time of our audit, we believe that county and State officials should monitor the downtime more closely.

Two items purchased in 1970 were not being used: (1) a large total oxidant analyzer purchased for \$5,775 and (2) stack-testing equipment purchased for \$987. Updated equipment replaced the total oxidant analyzer in fiscal year 1973; discussions are in progress with State officials on how to best dispose of the analyzer.

The stack-testing equipment was purchased in fiscal year 1970 for proposed tests, but no stack testing has been made and none is contemplated. The Air Pollution Control Supervisor told us that stack testing would require more equipment and personnel experience than is available and that the Maryland Bureau of Air Quality Control could make stack tests if needed. He intends to keep the equipment since it may be used at a later time. He did not agree to report it to EPA as excess equipment.

Recommendation

We recommend that EPA consider whether this excess equipment could be used by some other grantee.

B. TESTING

1. Economy in testing methods

According to the supervisor, technical merit, rather than economy, primarily determines the best method for collecting and testing samples. An official of EPA's Office of Air Monitoring agreed and said that the first consideration must be which method will best satisfy the need since there are differences in accuracy, response times, and other technical factors.

Although we agree that technical merit must be a prime consideration, economy of price and operation should be reviewed and considered in each equipment purchase.

2. Factors considered in air-sampling locations

The Air Pollution Control Supervisor told us that he had used the factors specified in EPA's "Guidelines: Air Quality Surveillance Networks," in deciding the number and placement of sampling stations. These factors included high population densities, meteorology, topography, present and projected land uses, and pollution sources. He based his decisions on knowledge of EPA guidelines, his personal experience, public demands for information, and consultations with Maryland officials.

We obtained a map locating all stations and describing the characteristics of each area, such as its population density, whether it is a commercial or residential district, etc. We visited 9 of 13 stations and verified the locations and descriptions and found the stations to be as described. In our opinion, the county had followed the "Guidelines: Air Quality Surveillance Networks."

3. Calibration of equipment

To determine whether sampling and analytical instruments had been calibrated before installation

and routinely thereafter, we examined the records for two of three continuous monitors and interviewed the individual generally responsible for their calibration. According to the records, both monitors were calibrated before installation, checked daily for accuracy, and calibrated thereafter as necessary. The individual responsible for manual sulfur dioxide and nitrogen dioxide monitors said that the only calibration required was that of the needle orifice. He said that this calibration was performed weekly in the laboratory. We were also told that particulate samplers were calibrated every 2 to 3 months when the motors are rebuilt.

C. PERSONNEL

1. Staff qualifications

We reviewed the files of all personnel assigned to the Air Pollution Control Section to determine whether they met the minimum qualifications in EPA's "Guide Class Specifications for Air Pollution Control Programs in State and Local Programs." Table 1 lists positions in the fiscal year 1973 and 1974 grant applications. We found no cases in which the personnel involved failed to meet experience qualifications.

Table 1

Positions in Fiscal Years 1973 and 1974
Grant Applications (note a)

<u>Position</u>	<u>1973</u>	<u>1974</u>
Air pollution supervisor	1	1
Sanitarian III	1	1
Environmental health engineer II	1	1
Sanitarian II	2 (1)	2 (1)
Environmental inspector II	1 (1)	1 (1)
Environmental inspector I	9 (2)	9
Laboratory scientist	1	1
Clerk typist	2 (1)	1
Secretary	<u>1</u>	<u>1</u>
Total	<u>19 (5)</u>	<u>18 (2)</u>

^aVacancies as of June 30, 1973, and December 31, 1973, in parentheses.

2. Salary determination

According to the county personnel office wage and salary specialist, who is generally responsible for establishing staff salaries, county salaries are derived from wage surveys and a number of outside references, including the annual Local Government Personnel Salary Survey. We compared the salaries for positions in the Air Pollution Control Section with salaries for similar positions, such as health and water quality inspectors, in Sassafra County and found that they were comparable.

3. Personnel controls

We interviewed air pollution control officials and reviewed records to determine whether controls were in effect to insure that staff members were on the job and performing their assigned duties. Inspectors keep daily logs and maintain contact with the office by two-way radio. The rest of the air pollution control personnel work in the county office.

We reviewed activity summaries for fiscal year 1973 and for the first half of fiscal year 1974 to determine whether staff members were devoting full time to the program. The activity summaries show that staff members spent (1) 163 hours, costing about \$800, in April 1973 on a solid waste survey and (2) 240 hours, costing about \$1,100, in May and June 1973 on such matters as rubbish and weed control and shopping center inspections. We concluded that it was not proper to charge personnel costs of about \$1,900 to the program which shared costs with EPA.

In view of these questionable charges to the program in 1973, we also reviewed the procedures and time summaries applicable to the first 6 months of fiscal year 1974.

The semiannual report for the first half of fiscal year 1974 indicates that one inspector spent

100 percent of his time on solid waste activities and that three others spent approximately 27 percent of their time on solid waste activities.

Recommendation

Because the fiscal year 1974 grant stipulated that the people filling positions would spend 100 percent of their time on air pollution control activities, we recommended that the county revise its procedures so that the program would be charged only for the time of personnel working on that program. The county indicated that when it claimed reimbursement from the Federal Government for 1974, only actual hours spent on air pollution control would be included.

We recommend also that, in the future, the county indicate in its grant applications and the claims for reimbursement the percentages of time each employee spends on air pollution control activities. The Sassafras Director of Environmental Resources said this would be done. EPA Region III officials told us that a determination would be made as to allowability of these costs under Sassafras County's grant.

4. Staff travel

Air pollution control travel expenses for the year ended June 30, 1973, were \$11,251; \$10,338 was local travel. Mileage at the rate of 9 cents for sedans and 15 cents for vans was charged to the program. The Sassafras County Motor Pool furnished vehicles for all local travel.

To determine whether staff travel was program related and approved and whether costs were reasonable, we examined the travel requests for fiscal year 1973.

In fiscal year 1973 the Air Pollution Control Supervisor, with prior approval by the department director and the county chief administrative

officer, attended the annual Air Pollution Control Association meeting at Miami Beach from June 18 to June 22. Actual daily expenses averaged \$38.67.

The air pollution control engineer, with county officials' approval, attended EPA's training course entitled "Control of Gaseous Emissions" at Durham, North Carolina, January 24 to 28, 1973. Average daily expenses were less than \$25 a day.

County travel guidelines state that reasonable actual costs incurred on program-related travel will be reimbursed. We believe that the travel cited above, in addition to all other travel audited, was program related and that costs were reasonable.

5. Staff training

We reviewed the training files and the travel vouchers of air pollution control personnel to determine whether staff training was job related.

In one case the relevance of the staff training to air pollution control appeared questionable. The enforcement chief attended a 2-day course at The George Washington University entitled "Solid Waste Management for Hospitals."

Regarding the relation of the course to air pollution control, the department director said:

"State air pollution regulations controlling emissions from incinerators at hospitals and nursing homes will require significant changes in solid waste disposal practices at these facilities. This course will provide the attending staff member with a better understanding of current practices and alternatives."

Since hospital solid wastes are burned in incinerators, we concluded that the training was program related.

Two individuals attended the bureau's 3-1/2-day training course on the various aspects of the State air monitoring system. The only other training in fiscal year 1973 was a 3-day course on visible emissions given at the University of Maryland for air pollution inspectors.

We concluded the \$965 spent on training was program related.

CHAPTER 3

PROGRAM RESULTS

The principal activities of the county's Air Pollution Control Program are air pollution abatement and air monitoring. The goals of the air pollution abatement activity, as stated in the approved grant and report of operations, are to

- effect controls over pollutant emissions from sources specified in State and county air pollution control regulations and
- encourage the elimination or control of unnecessary or excessive air pollution emissions from human activities in the county.

The purpose of the air monitoring activity is to obtain the necessary ambient air quality data so that

- the effectiveness of the abatement program can be measured,
- necessary abatement actions can be taken where ambient air quality levels indicate excessive concentrations, and
- timely actions can be instituted when ambient air concentrations exceed minimum health-related standards.

To assess county progress related to the above goals, we reviewed the activity reports and the supporting records of the Air Pollution Control Section from July 1, 1972, to December 31, 1973. We also reviewed the county's progress toward achieving the specific objectives set forth in the fiscal year 1973 Federal Air Pollution Control Program grant.

The results of our review of the effectiveness of the county's program and its monitoring and abatement activities follow. In reviewing the county's

efforts, it should be noted that in 1973 between 87 and 99 percent of air pollutants in Sassafras County originated from sources controlled by either the State or the Federal Government. Thus, the over-all impact of the county's pollution control efforts are limited.

A. ACTIONS TAKEN BY SASSAFRAS COUNTY
TO REDUCE AIR POLLUTION

The reduction of atmospheric pollution to the lowest possible levels within given economic constraints is one of the county's principal objectives stated in the EPA grant. To accomplish that objective, several intermediate objectives to be accomplished during 1973 and 1974 were specified in the grant applications. The intermediate abatement objectives and our comments on the county's progress in meeting those objectives follow.

1. Registration and review
of all existing sources

One objective was to register significant existing sources of pollution in the county by fiscal year 1973. As part of the cooperative agreement, under the Maryland State Implementation Plan, Maryland has requested that the county review all registered sources annually to insure compliance with registration requirements. The county reported in the fiscal year 1974 semiannual report that 2,100 sources had been registered by the end of fiscal year 1973. The Air Pollution Control Section and the State consider this to be all existing sources. In the first half of fiscal year 1974, 926, or 44 percent, of the registered sources were reinspected. Sassafras County reported that all sources would be visited before April 1974.

We reviewed the registration forms of those sources which had been reinspected and discussed the procedures with inspectors. We concluded that the reinspections had been effective in identifying changes in equipment and violations of regulations.

When violations were noted, followup visits were conducted and recorded to insure compliance.

2. Incinerator closures

The grant stated that the county would order closure of all incinerators violating Maryland regulations in 1973 and 1974. By the end of 1973, 502 owners or operators had been directed to cease incinerator operations. At December 31, 1973, 42 private incinerators and 13 government incinerators were still operating. Most of these were expected to be phased out either by orders originating from violations or by the July 1974 required phaseout date. Approximately 15 incinerators were to remain in operation after July 1, 1974. These were hospital, pathological, or animal crematory types of incinerators which are permitted by EPA regulations.

3. Open burning permits

The grant specified that the county would tighten restrictions on open burning permits and minimize land clearing open fires. The number of open burning permits issued in fiscal year 1973 decreased 21 percent from the number issued in the previous year.

We compared selected declined permits in 1973 with approved permits in 1972 and noted that similar permits which had been approved the previous year were disapproved in 1973.

The county anticipated that after July 1974 there would be a drastic reduction in approved permits due to a Maryland regulation which would increase from 200 to 500 yards the distance requirement between the fire and the nearest occupied structure or heavily traveled public road.

4. Control of particulates from construction and material handling

The county indicated in the fiscal year 1973 grant that a program was to be established for controlling particulates from construction and material handling. Dust and other materials originating from construction projects, unpaved roads, truckloads, and industrial operations continue to be major problems. The Air Pollution Control Section has attempted to define the responsibilities of the Police Department, the Department of Public Works, and the Air Pollution Control Section in obtaining compliance with various portions of the proposed county air pollution control ordinance. However, as of the end of 1973, no final agreement had been reached and the condition remained unchanged.

Recommendation

We recommend that the Council, in its consideration of the proposed air pollution control ordinance, define clearly the responsibilities of the county units for enforcing the ordinance.

5. Fuel conversions

Another intermediate goal specified in the grant was to initiate fuel oil and fuel burning equipment changes at schools and other large installations.

The Air Pollution Control Section reported that the abatement unit contacted all users of residual fuel oil and coal who were required to make conversions or add equipment before October 1, 1973. According to the fiscal year 1974 semiannual reports, all facilities were in compliance as of December 31, 1973. A total of 233 conversions to either natural gas or distillate oil were required and occurred through 1973.

The county public school system must convert all of its school facilities from residual fuel oil or install particulate-capturing equipment by

October 1, 1974. As of March 31, 1974, the school system had not submitted a plan for compliance despite Air Pollution Control Section requests.

Recommendation

We recommend that the Council require the Superintendent of Schools to submit a fuel conversion plan, as requested by the Air Pollution Control Section.

6. Major source testing

The grant application indicates that by fiscal year 1973, 30 percent of the major sources would be tested for compliance with emission regulations.

According to the fiscal year 1974 grant application, there are nine major sources of pollution in Sassafras County and only one of the required three sources had been tested as of December 31, 1973.

County officials had requested that the major sources be tested by State officials under the cooperative agreement included in the State Implementation Plan. State officials indicated that the testing teams were behind schedule but would be catching up in the next 6 months.

Since the county does not have the expertise or all the equipment to conduct these source tests, it must rely on the State to satisfy this portion of the grant objectives.

Recommendation

We recommend that EPA review the State testing schedule to insure that major source testing is accomplished in line with local program grant objectives. Without major source testing, emission standards could be violated without detection and correction.

B. IMPACT OF PROGRAM AS SHOWN
BY EMISSION INVENTORIES

Trends in emission inventories indicate the effectiveness of air pollution control activities. EPA's "Guide for Compiling a Comprehensive Emission Inventory" states that:

"The proper emission control strategy for a specific air pollution problem is dependent upon an adequate assessment of the nature and extent of the pollution in the region involved. This assessment includes a review of existing levels of pollutants, the sources and their emissions, the techniques available for their control, and the probable increase in source emission resulting from urban and economic growth. The emission inventory indicates the major contributors (motor vehicle, industrial, etc.), and this information, in turn, directs the thrust of control efforts. * * * If the emission inventory is updated annually, a decrease in emissions should be reflected over a period of years. This decrease would then be a measure of the effectiveness and success of the control and could be used to indicate areas where program modification would be useful."

1. Emission inventory trends

Emission inventories are calculations of tons of pollutants emitted into the atmosphere for an entire year for a given geographical area. Calculations are based on fuel consumption and processes which contribute to each type of pollutant. The following table shows the emission inventories from all significant sources calculated by Sassafras County at December 31, 1970, the first period for which such inventories were available and the inventories at December 31, 1972 and 1973.

Table 2

County Emission Inventories

	<u>1970</u>	<u>1972</u>	<u>1973</u>
	----- (tons) -----		
Particulates	6,652	7,951	10,866
Sulfur oxides	67,591	72,596	48,906
Hydrocarbons	72,397	48,783	56,316
Nitrogen oxides	37,246	40,334	44,431
Carbon monoxide	397,023	310,587	335,744

County officials told us that beginning with 1970 the inventories for each of the years were complete and that the composition of pollution sources had not changed significantly.

The inventories show that pollution decreased between 1970 and 1973 for the following pollutants: sulfur oxides, hydrocarbons, and carbon monoxides. The inventories show, however, that two pollutants (particulates and nitrogen oxides) increased between 1970 and 1973.

2. Sources of air pollution

County officials attributed the increase in particulates to emissions from a public utility power plant. Under its Implementation Plan, Maryland is solely responsible for obtaining compliance of power-generating sources in the State. Maryland's Implementation Plan contains an order of the Maryland Secretary of Health and Mental Hygiene to the Sassafras Electric Power Company which requires the company's county generating station to meet specified conditions and schedules and to report directly to the Maryland Bureau of Air Quality Control.

State officials told us that the power company had submitted a compliance plan and that the company was complying with the plan. State officials were

aware of the emission impact of the plant and were closely monitoring it.

The county officials attributed the increase in nitrogen oxides to emissions from (1) the same power-plant and (2) motor vehicles over which the Federal Government has primary responsibility for pollution control.

The table below shows, for December 31, 1972 and 1973, the extent that the county was responsible for controlling the pollution sources. The percentages are based on emission inventories prepared by Sassafras County.

Table 3

	<u>Partic- ulates</u>	<u>Sulfur oxides</u>	<u>Hydro- carbons</u>	<u>Nitrogen oxides</u>	<u>Carbon monoxide</u>
	(percent)				
POLLUTANTS IN 1972:					
Sources not under control of the county:					
Power generation (one plant)	68	94	1	37	-
Mobile sources	<u>13</u>	<u>1</u>	<u>97</u>	<u>57</u>	<u>99</u>
Subtotal	81	95	98	94	99
Sources under the control of the county					
	<u>19</u>	<u>5</u>	<u>2</u>	<u>6</u>	<u>1</u>
Total	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
POLLUTANTS IN 1973:					
Sources not under control of the county:					
Power generation (one plant)	77	92	1	39	-
Mobile sources	<u>10</u>	<u>2</u>	<u>97</u>	<u>55</u>	<u>99</u>
Subtotal	87	94	98	94	99
Sources under the control of the county					
	<u>13</u>	<u>6</u>	<u>2</u>	<u>6</u>	<u>1</u>
Total	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

The above table shows that, in 1972, the power-plant and motor vehicles--for which air pollution control are the responsibility of the State and Federal Government--accounted for between 81 and 99 percent of the five pollutants in the county. In 1973

those sources accounted for between 87 and 99 percent of the pollutants.

Pollution sources for which the county is responsible accounted for 1 to 19 percent of the pollutants in 1972 and 1 to 13 percent in 1973, with the largest percentage applying to particulates. Thus, of the county efforts, those directed at controlling emissions of particulates have the greatest impact on improving air quality. This is due primarily to the county's efforts to close incinerators and convert coal and residual oil furnaces to cleaner sources of energy.

As shown below, the tons of particulates emitted from sources for which the county is responsible decreased during 1973.

Table 4

	<u>1972</u>	<u>1973</u>
Emission inventory, particulates in tons	7,951	10,866
Emissions (percent) from sources for which the county has responsibility	19	13
Particulate emissions from those sources (tons)	1,511	1,413
Decrease in 1973 (about 7%)		98

C. QUALITY OF AIR

National primary ambient air quality standards define levels of air quality which the Administrator of EPA judges are necessary, with an adequate margin of safety, to protect the public health. EPA established standards which include the following:

National Air Quality Primary Standards

<u>Pollutant</u>	<u>Concentration - period</u>	<u>Frequency not to be exceeded</u>
Sulfur oxides	^a .14 ppm - 24 hour average	Once a year
Particulates	^b 260 mg/m ³ - 24 hour average	Once a year
Carbon monoxide	9 ppm - 8 hour arithmetic average	Once a year
Photochemical oxidants	.08 ppm ozone - hourly average	Once a year
Nitrogen dioxide	.05 ppm - annual arithmetic average	Yearly average not to be exceeded

^aParts per million.

^bMilligrams a cubic meter.

Photochemical oxidants are the result of chemical reactions which take place in the atmosphere between nitrogen oxides and hydrocarbons under the influence of sunlight. The amount of hydrocarbons in the atmosphere limits the maximum amount of photochemical oxidants which can be formed.

1. Standards exceeded in Sassafras County

Our comparison of the EPA standards and the samples taken by the county during fiscal year 1973 and the first half of fiscal year 1974 are presented in table 5 on the following page.

Because the standard for photochemical oxidants is for 1-hour periods, it is possible for the standard to be exceeded up to 24 times in 1 day. To

properly gauge the quality of air in a given location, it is necessary to know both the number of times and the number of days standards were exceeded.

Table 5

	Number of times primary standards were <u>exceeded</u>	Number of days on which standards <u>were exceeded</u>
Fiscal year 1973:		
Particulates	-	-
Sulfur oxide	-	-
Nitrogen oxide	-	-
Carbon monoxide	24	24
Photochemical oxidants	<u>66</u>	<u>17</u>
Subtotal	<u>90</u>	<u>41</u>
First half of fiscal year 1974:		
Particulates	-	-
Sulfur oxide	-	-
Nitrogen oxide	-	-
Carbon monoxide	17	17
Photochemical oxidants	<u>106</u>	<u>28</u>
Subtotal	<u>123</u>	<u>45</u>
Total	<u>213</u>	<u>86</u>

As shown, the primary standards for carbon monoxide and photochemical oxidants were exceeded 86 days during the 18 months. The standards were exceeded more during the first half of 1974 than during the entire 1973 fiscal year.

The Metropolitan Council of Governments' news releases indicate that emissions from mobile sources in conjunction with adverse meteorological conditions were the probable reason the standards were exceeded. As indicated previously, pollution control responsibility for new mobile sources is assigned to the Federal Government.

Records of air quality monitoring data showed that readings were not taken on several days because equipment was being calibrated or had malfunctioned. On other days readings were not taken every hour. The following table shows the extent that the data shown in table 5 is incomplete.

Table 6

	<u>Number of days during which monitors were calibrated or malfunctioned</u>	<u>Total hours for which no samples were taken</u>	<u>Percent of hours with no data</u>
Fiscal year 1973:			
Carbon monoxide	88	1,852	21.1
Photochemical oxidants	240	2,619	29.9
First half of fiscal year 1974:			
Carbon monoxide	43	624	14.3
Photochemical oxidants	56	917	21.0

If standards for carbon monoxide or photochemical oxidants were exceeded during these periods, no record was made. Instances of standards being exceeded therefore may have been more than shown in table 5.

2. Instances of standards exceeded not reported by the county

The county's report of operations for fiscal year 1973 and its semiannual report for the first 6 months of fiscal year 1974 reported the number of times pollutant levels exceeded ambient air quality standards as follows.

Table 7

Reported number of times
standards were exceeded

<u>Pollutant</u>	<u>Fiscal year 1973</u>	<u>First half fiscal year 1974</u>
Carbon monoxide	19	10
Photochemical oxidants	<u>31</u>	<u>26</u>
Total	<u>50</u>	<u>36</u>

As may be seen by the following comparison, Sassafras County did not report 127 instances of the standards being exceeded during the 18-month period.

Table 8

Comparison of actual with
reported instances of standards exceeded

	<u>Fiscal year 1973</u>	<u>First half fiscal year 1974</u>	<u>Total</u>
Actual recorded instances of standards being exceeded:			
Carbon monoxide	24	17	41
Photochemical oxidants	<u>66</u>	<u>106</u>	<u>172</u>
Total	<u>90</u>	<u>123</u>	<u>213</u>
Reported instances of standards being exceeded:			
Carbon monoxide	19	10	29
Photochemical oxidants	<u>31</u>	<u>26</u>	<u>57</u>
Total	<u>50</u>	<u>36</u>	<u>86</u>
Unreported instances of standards exceeded	<u>40</u>	<u>87</u>	<u>127</u>

Of even greater importance, the reported instances made it appear as though the efforts at controlling air pollution in Sassafras County in the first half of fiscal year 1974 were much more effective than they had been. Standards had been exceeded a greater number of times in the first half of fiscal year 1974 than in all fiscal year 1973.

The county explained that this occurred because summaries prepared by the environmental health engineer were erroneous and the Air Pollution Control Supervisor did not verify the reports before publication. To the extent that we could determine, the errors by the engineer were simply inadvertent arithmetic errors.

Recommendation

We brought this to the attention of the Air Pollution Control Supervisor and recommended that future reports be reviewed more carefully. The supervisor agreed with our findings and promised that, in the future, the reports would be reviewed carefully to be sure that they are accurate.

We also recommended that the county fully comment on this situation in its report to the State on compliance with the State Implementation Plan and the report to EPA on status of the program. The Air Pollution Control Supervisor agreed and the next report of operations will contain comparative statistics.

3. Actions taken when pollution reached danger levels

Maryland's Implementation Plan contains an air pollution episode plan designed to control pollutant emissions during periods of poor atmospheric ventilation and rising levels of pollution concentrations where danger is imminent regarding human health. The Maryland State Implementation Plan also recognizes a regional air pollution episode plan adopted by the Metropolitan Council of Governments. Both plans specify one forecast and three action stages based on episode criteria recommended by EPA.

According to statements of responsibility in the two episode plans, either the Council or Maryland would initiate episode plan action for the county.

County records show that during the 18 months reviewed, the episode criteria were exceeded on 33 days; however, records of the Maryland Bureau of Air Quality Control and the Council showed that episode plans were put into effect on only 9 of those days.

According to a Council official, the Council does not initiate an episode alert unless the criteria are exceeded in more than one jurisdiction. The Council obtains hourly readings of pollutants for each jurisdiction. However, records were not kept for the period we audited. We did not review air monitoring data in other jurisdictions to determine whether the episode criteria were exceeded in other jurisdictions on the same days that they were exceeded in Sassafras County.

An official of the Air Pollution Control Section told us that Sassafras County increased monitoring activities, contacted all holders of open burning permits, and told police and fire departments of bans on open burning and insecticide and herbicide spraying. Sassafras County also participated in conference calls with the Council and Maryland officials. The county did not notify incinerator operators because the incinerators are not major sources of the pollutants which exceeded primary standards.

The county did not call all sources required by Maryland to submit a standby emission reduction plan. According to county officials, this action was not taken because the State Secretary of Health and Mental Hygiene has not formally approved any of the plans. Maryland officials said that, even if these plans had been approved, the conditions in the county would not have caused the plans to be implemented.

Effects of episode plans

In our judgment, the only major actions taken were news releases made by the Council. The releases informed citizens of the air pollution situation and advised the elderly and persons with heart, respiratory, and other conditions sensitive to air pollution to stay indoors. Since the concentration of pollutants came mainly from motor vehicle exhausts, commuters who usually traveled to work by automobile were urged to form carpools or use public transportation.

The county did not have data to indicate whether persons with heart, respiratory, or other conditions complied with the county's advice. The Council has indicated, however, that there was a general lack of response to news releases requesting persons to form carpools or use public transportation. On the days of episodes, there were no major increases in public transportation ridership.

Prospects of meeting 1975 goals

Although Sassafras County has met many of its intermediate abatement goals, the national air standards for carbon monoxide and photochemical oxidants are being exceeded at an increasing rate. Since the sources of these pollutants are not effectively under county control, the county will be forced to rely on actions by the State and Federal air pollution control agencies. Unless there are dramatic changes in the efforts of these agencies, the prospects of the air pollution standards being met in Sassafras County by 1975 are not good.

GUIDELINES FOR AUDIT
OF
AIR POLLUTION CONTROL PROGRAM
SASSAFRAS COUNTY, MARYLAND

I. INTRODUCTION

Under the 1967 Air Quality Act and the Clean Air Act of 1970, the Congress provided for technical and financial assistance to support air pollution prevention and control programs at the State and local levels on the belief that prevention and control of air pollution at its source is the primary responsibility of these governments. Since 1968 Sassafras County has received Federal assistance from EPA to finance an Air Pollution Control Program. Sassafras County's plan of operation is a part of the Maryland State Implementation Plan. A Federal requirement specifies that the plan be implemented by 1975.

The purpose of this audit is to evaluate all aspects of Sassafras County's Air Pollution Program: financial statements and compliance, economy and efficiency, and program results.

II. FINANCIAL REPORT AND COMPLIANCE

A. OPINION ON FINANCIAL REPORT

Determine whether the program's expenditure report is fairly presented and give an appropriate opinion.¹

¹Financial audit procedures should be more encompassing but, for purposes of this illustration, they have not been expanded.

As part of this examination, the auditor should evaluate the system of internal controls and consider the results of that evaluation in determining the extent that transactions should be tested.

The auditor should also determine what other audits have been made of air pollution control activities in the county and whether any part of such audits can be used for purposes of this audit.

B. COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS

1. Determine whether a local air pollution control ordinance has been passed and, if so, whether the county is complying with its provisions.
2. Determine whether EPA has approved the transportation control strategies in the State Implementation Plan. If so, determine whether the county has complied.
3. Determine whether Sassafras County submitted the required annual expenditure report within 90 days after the end of the budget period.
4. The fiscal year 1973 grant application specifies that support beyond December 1972 was contingent upon submission by November 30, 1972, of a plan detailing the program's scheduled activities. Determine whether this condition was complied with.
5. Determine whether program funds, Federal and non-Federal, were used only for the purposes stated in the grant application and for those items enumerated in the approved budget.
6. Determine whether proper accounting cutoffs and accruals were made so that program funds were spent and/or obligated only during the budget period covered by the award.

7. Determine whether Sassafras County obtained prior approval of EPA for budget changes involving:
 - a. Transfer of non-Federal funds that would substantially alter the scope or purpose for which the grant award was made.
 - b. Expenditures of Federal funds that would result in a cumulative increase in the grant total of any budget category of more than 25 percent, or \$1,000, whichever is greater.
 - c. Expenditures of Federal funds that would be made in a budget category for which no funds were approved.
 - d. Acquisition of any item of equipment costing in excess of \$1,000 which was not specifically enumerated in the approved grant application and which is wholly or partly supported by Federal funds.
8. Determine whether Sassafras County obtained the necessary non-Federal funds for the grant period and spent such funds so that appropriate non-Federal/Federal matching ratio requirements were attained.
9. Determine whether fiscal records show on a current basis the amount and disposition of Federal funds received, the total cost of the activity in connection with which such funds were provided, and the amount of that portion of the cost of the activity supplied by non-Federal sources.
10. EPA has established primary and secondary standards for measuring ambient air quality. The standards are set for six pollutants as are the methods for measuring their presence in the air. For the standards and methods, refer to the following paragraphs of Federal Register Vol. 36, No. 84, Part II, April 30, 1971. In regard to the measurement of air quality:

- a. Determine whether the methods specified by EPA are used by Sassafras County for monitoring and analyzing air quality.
- b. Determine whether the Maryland air pollution agency evaluates Sassafras County's methods of air quality measurement for compliance with EPA specified methods.
- c. Cite those instances where Sassafras County's methods are different from EPA's prescribed methods.
- d. Where Sassafras County uses other than an EPA prescribed method, obtain an expert opinion as to the validity of the measurement that was obtained using the alternate methods.
- e. If Sassafras County does not measure all six pollutants, determine why the pollutants are not being measured and if there are plans to measure them in the future.
- f. If a total hydrocarbon-methane air monitor was purchased in whole or in part with Federal funds, determine whether prior approval was obtained from EPA.

III. ECONOMY AND EFFICIENCY

A. EQUIPMENT AND SUPPLIES

1. Determine whether procedures exist to preclude purchase of other than needed equipment and supplies.
2. Determine whether procedures exist to promote purchase of equipment and supplies at economical prices.
3. Determine whether equipment records are maintained and, if so, comment on their accuracy.

4. Determine whether excess supplies are on hand.
5. Physically verify the existence of a representative number of items and determine whether the items are in good working order and in use.

B. TESTING

1. Determine what basis Sassafras County used to choose its methods of collecting and testing air samples and what consideration was given to economy in making that choice.
2. In decisions regarding the number and placement of sampling stations, determine whether Sassafras County considered factors specified in, "Guidelines: Air Quality Surveillance Network," EPA, May 1971.
3. Determine whether sampling and analytical instruments were calibrated before installation and routinely thereafter.

C. PERSONNEL

1. Determine whether the program's staff meets EPA's minimum qualifications in its publication "Guide Class Specifications for Air Pollution Control Positions in State and Local Programs," July 1971.
2. Determine the procedures for establishing staff salaries.
3. Determine whether controls are in effect to insure that staff are on the job and performing their duties. For any staff not devoting full time to the program, determine whether procedures are adequate to insure that the portion of time charged to the program is reasonable.

4. Determine whether staff travel was program related, whether proper prior approval was obtained, and whether costs appear reasonable. Use \$25 a day as a basis for judging the reasonableness of per diem costs. Report instances where this amount was exceeded.
5. Determine whether staff training was job related.

IV. PROGRAM RESULTS

- A. Determine whether Sassafras County has achieved its intermediate abatement objectives as stated in 1973 grant application. Specifically, determine the objectives and accomplishments in regard to:
 1. Registration and review of existing sources.
 2. Incinerator closures.
 3. Open burning permit issuances.
 4. Construction and material handling controls.
 5. Fuel conversions.
 6. Major source testing.
- B. Determine whether Sassafras County is achieving its goals of reducing air pollution:
 1. Obtain and report inventories calculated for pollutant emissions at the end of 1972 and 1973, and compare with the earliest inventories available to determine changes in pollutant levels.
 2. Obtain and report on the percentage of the sources that are controllable by Sassafras County and those noncontrollable by the county at the end of fiscal years 1972 and 1973.

- C. Determine whether there have been any instances where pollution levels in Sassafras County have exceeded EPA's primary National Ambient Air Quality Standards. If so:
1. For the 18 month period ended December 31, 1973, determine the number of days in which a primary standard has been exceeded identifying the pollutant(s) and the cause or probable cause of the high pollutant level and whether these instances were appropriately reported.
 2. Determine whether the instances when the standards were exceeded were properly reported.
 3. Determine whether the Maryland Air Pollution Episode Plan was put into effect when applicable criteria were exceeded. Determine if there were differences between actions specified in the Plan and actual actions taken. Obtain explanations for any deviations from the plan.