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STATE AIR DATA INFORMATION SURVEY



U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Water Programs
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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by

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Section 1. PROJECT SUMMARY AND MAJOR FINDINGS

1.1 SURVEY OBJECTIVES

A State Air Data Information Survey was conducted under the auspices of the National Air Data Branch, EPA to identify and investigate possible problems at the state level that are associated with emission inventories and air quality data systems. The study concerns itself with problems arising during the normal course of daily activities as well as concentrating on the problems related to the Federal requirements for quarterly and semi-annual reports of air quality and emissions data.

The more significant conclusions of the survey are presented in this section. The reports of the detailed analyses are contained in Sections 2, 3, 4, which deal with the basic resources, emission inventory system and air quality data systems respectively.

1.2 SUMMARY OF MAJOR FINDINGS

Operating problems as well as those arising from Federal reporting requirements are constrained to a few specific agencies rather than being generally present at all agencies. The problems that did appear are related to differences in coding practices used for emission inventory systems. The relatively long period during which SAROAD has been available as a system seems to have alleviated problems in handling air quality data insofar as reporting procedures are concerned. Nonetheless, there seems

to be a greater need to automate air quality files than emission inventory files. This probably stems from the differences in size, frequency of reference and data processing requirements between the two types of files.

The major findings are presented below in four categories as follows:

- a. Emission Inventory System
- b. Air Quality Data System
- c. Federal Reporting Requirements
- d. Government Support

1.2.1 Major Findings - Emission Inventory Systems

1. Eighty percent of the agencies currently having manual emission inventory systems will convert to automated systems as early as practicable. Those agencies not opting for automation are characterized by being responsible for monitoring a small number of air pollution sources. The cut-off point appears to be near 100 file entries such as a permit or NEDS form.
2. The availability of CDHS, particularly EIS, will benefit a significant number of agencies (approximately 15-20). The ability to automate with assurance that NEDS reporting compatibility will be achieved will reduce agency resource requirements to store, maintain and access emission inventory data.

3. The requirement for reporting emissions data in NEDS format on a semi-annual basis does not impact those agencies whose existing emission inventory system are compatible with the NEDS specifications. On the other hand, where state agencies have non-compatible systems, there are serious problems in converting to NEDS formats. The difficulties arise from the need to cross-reference such data elements as source identification, source classification codes, units of measure, source definition and to a lesser extent differences between the data elements maintained versus the elements required by NEDS.
4. At least 90% of all agencies have, or could have, access to computer facilities whose use would benefit the collection, storage, maintenance and access of emissions data. [This capability is important as a means of recompiling inventories in order to review and modify rules and regulations especially when it comes to accommodating changes necessitated by such situations as the energy crisis.]
5. Agency resource requirements, especially as related to manpower, are reduced for automated systems provided that the agency does not undertake the development of the system. Furthermore, automated systems reduce the dependence of manpower requirements on the size of the emission inventory. The manpower savings achieved by installing existing automated systems as opposed to locally developing such systems is estimated to be at least 2 man years/year which represent manpower development costs.

6. Agencies planning to automate their emission inventory systems have access to at least six automated systems. Four are available from other state agencies. One, the Emission Inventory Subsystem (EIS) of CDHS is available from the government. At least one is available from industry.

1.2.2 Major Findings - Air Quality Data Systems

1. Approximately 50% of the state agencies have computer based air quality data system. At least 90% of the remaining agencies will convert to automated systems in the near future.
2. All agencies have air quality data systems which are essentially compatible with SAROAD. SAROAD perfected input formats are used by at least 70% of the state agencies. SAROAD reporting formats are used by at least 85% of the agencies.
3. The storage, access and maintenance of air quality data present no unusual problems to air pollution control agencies.

1.2.3 Major Findings - Federal Reporting Requirements

1. All agencies are aware of the Federal reporting requirements as expressed in the Federal Register, Vol. 38, No. 149, August 3, 1973, as well as the support provided through NADB. However, few agencies having manual systems have prepared

semi-annual reports and, as a consequence, may have underestimated the impact and difficulty of this requirement.

2. The Federal reporting requirement for quarterly and semi-annual reports of emission and air quality data does not significantly impact air pollution control activities at the state level. Less than 18% of the agencies responded that federal reporting impacted their operations. The impacts that were reported were small and for short periods of time.

1.2.4 Major Findings - Government Support

1. The government program to distribute information regarding support and services in the fields of emission inventories and air quality has been effective. Additional efforts are desirable to publicize the services available from NADB such as those provided by remote terminals located at Regional Offices.
2. Government provided automated systems for emissions inventories and air quality data are desirable. Development of the systems, particularly those designed for installation at agency locations should be accelerated to meet agency requirements.

1.3 CONDUCT OF THE SURVEY

1.3.1 Purpose and Objectives

A survey of all state air pollution control agencies has been conducted under the auspicious of the National Air Data Branch of the office of Air Quality Planning and Standards of the Environmental Protection Agency. The survey was conducted to obtain information to describe the scope and size of state systems for handling emission inventory and air quality data for the purposes of identifying problems associated with the normal use of such systems as well as the impact of Federal reporting requirements. The specific objectives established for the survey project are:

- I. Develop for internal EPA use a standardized evaluation system that records at least the following items related to state and local air pollution control agencies:
 - a) techniques presently used to store, access, and maintain emission inventory and air quality data files.
 - b) significant problems associated with maintaining and using such files.
 - c) anticipated problems in meeting proposed Federal regulations for the state semi-annual and quarterly reporting requirements, especially as related to providing data in standard EPA formats.

II. Identify available computer based systems and alternative procedures for maintaining and using state files.

III. Recommend suitable options available to state agencies and delineate advantages and disadvantages of such alternatives.

1.3.2 Method and Schedule

In order to meet these objectives a survey project was established in late September 1974. The schedule for completing the project was relatively stringent and allowed two weeks for each of the four major tasks which consisted of:

- a. Development of the questionnaire and distribution to regions
- b. Completion of questionnaires at regional offices
- c. Compilation and analysis of completed questionnaires
- d. Preparation and delivery of the final report.

The plan of action adopted at that time allowed for the development of survey questions addressing each of the study objectives. A sample of the questionnaire form is contained in Appendix A. The type and scope of questions developed were influenced by the desire to limit the time to respond to not more than 30 minutes per state agency.

A total of thirty-three (33) questions were formulated. The questions were directed toward ascertaining; a) the basic resources of a state agency; b) type, capabilities and problems of emission inventory systems and c) type, capabilities and problems of air quality data systems. The questions related to air quality were restricted to the data handling functions and excluded those tasks related to data collection. Most of the questions were designed such that the responses would provide insight into more than one survey objective. The anticipated contribution of the questions to the study objectives is shown in Table 1-1, "Relationship of Questions to Project Objectives."

The questionnaires were distributed to each regional office by the National Air Data Branch (NADB). Various techniques were used by regional office personnel to complete the survey forms for each state air pollution control agency in the region. The completed forms were returned to the NADB, EPA in Durham, N. C. Copies of these forms were then forwarded to the project team responsible for analyzing the responses.

The responses to the questionnaires are summarized in a series of charts and tables which are contained in Appendix B, Survey Compilations. These compilations were reviewed and analyzed to form the body of the report. The compilations can be used also for purposes beyond the scope of this project; in particular, they can be used to identify subjects and problems for which more detailed investigation would be desirable.

Questions Applicable to:

Objective	Emission Inventory	Air Quality
Ia - Storage, Access and maintenance technique	4, 5, 7, 8, 12, 13 14, 15	22, 23, 24, 25, 27
Ib - Problems of main- tenance and use	4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 20, 21	23, 24, 26, 27, 28, 31, 32, 33
Ic - Federal reporting problems	1, 2, 5, 9, 10, 16, 17, 18, 19, 20, 21	1, 2, 24, 29, 30, 31, 32
II - Available system	3, Form 1	3, Form 2
III - Agency Option	1, 2, 3, 21	1, 2, 3, 33

Table 1-1. Relationship of Survey Questions to Project Objectives

The responses were generally definitive although not all questions were answered for each state agency. Appropriate adjustments were made during the analysis to disregard the lack of responses. For the most part there were sufficient responses from the 30 agencies to consider the results representative. In some instances results were considered sufficient to extrapolate the analysis to the 25 state agencies for whom responses were not available. The responses to only three questions 5c, 11 and 26 were insufficient for analysis.

1.3.3 Normalization Study

It was originally hoped to normalize the various responses based on the size of data files and some measure of size for the state. Several measures of state size were tested unsuccessfully before the normalization concept was abandoned. The measures of state size include area, industrial population, number of business establishments and industrial population density. Figure 1-1 is included to illustrate the wide scatter obtained in testing correlations between file size and state size. Figure 1-1 is a plot of the number of business establishments in a state versus the number of sources for that state in NEDS. The wide scatter of this plot is typical of the scatter obtained for other measures of state size. This wide scatter, coupled with the shortage of time for analysis, led to the abandonment of the normalization concept as an analytic tool for this project.

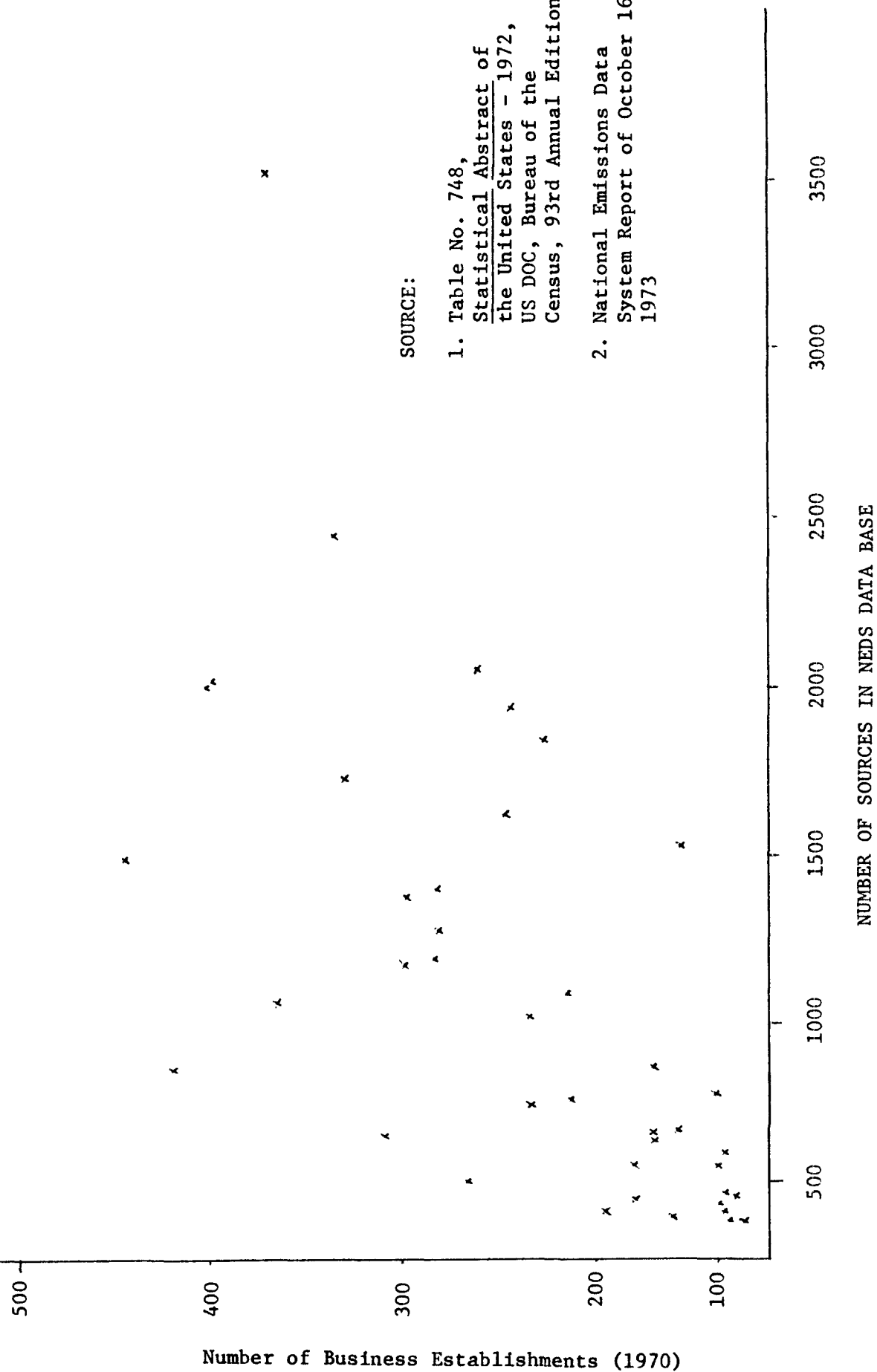


Figure 1-1. Plot of Business Establishments Versus Number of Plant-Point Sources in NEDS

1.4 STUDY CONSTRAINTS

The analysis and conclusions of this report are based primarily on the responses to the questionnaire and information made available from the NEDS report monitoring system. The latter information consists of:

- a. untitled report of number of emission sources contained in the NEDS (November 6, 1973)
- b. Monthly Status Report, Annual Pollutant Monitoring Summary dated September 10, 1973.

Additional sources of information are referenced in the text.

In those cases where ambiguities in questionnaire responses were observed, analytic interpretations were made. Such interpretations sought the most reasonable compromise among the conflicting responses.

The decision to restrict the time to complete a questionnaire to approximately thirty minutes limited the scope of the survey with regard to formulation of questions and the detail that could be obtained.

The stringent schedule precluded an intermediate test of the questionnaire prior to release to EPA.

Section 2. GENERAL RESOURCES AVAILABLE TO STATE AGENCIES

2.1 INTRODUCTION TO STATE RESOURCES

The topics of government support, computer facilities, data systems and manpower are considered to be the basic general resources available to state agencies for operating emission inventory and air quality data systems.

Government support is considered in Section 2.3 from the points of view of:

- a. services provided to agencies
- b. data systems made available to agencies
- c. effectiveness of the distribution of information regarding the services and systems.

Computer facilities available to state agencies are discussed in Section 2.4. The intent of this section is to establish the availability and capability of computer facilities as opposed to the current utilization of computers.

2.2 DISTRIBUTION OF TYPES OF DATA SYSTEMS

Various types of data systems are in use including manual, punched card and automated systems. The distribution of the types of data systems used by the various agencies provides a good background for comparing the use of existing resources and for visualizing the effect of resource availability nationwide. Survey questionnaires were returned for 30 states. This

number is believed to be large enough to be representative of all 55 state (or equivalent) air pollution control agencies. The statistics are not, however, considered representative of local agencies because of the difference in political and budgetary circumstances. The survey results are extrapolated to estimate the distribution of the type of systems used for emission inventories and air quality data systems.

Table 2-1 shows the distribution of emission inventory and air quality data systems as currently employed by the agencies responding to the survey and as extrapolated for a distribution for all state agencies. These results were obtained from question 5 and 21 of the questionnaires which are summarized by region in charts 5 and 21 of Appendix B.

Table 2-1 shows that most agencies (70%) have manual emission inventory systems whereas over half have automated or punch card air quality systems. Only a few agencies (7%) have been able to automate both systems.

The third column of Table 2-1 was consolidated from the results of questions 21 and 33 which addressed the subject of agency satisfaction with their current system. Seventeen agencies (80%) were dissatisfied and can be expected to change to an automated system. The questionnaires of the 21 agencies using manual systems were reviewed for possible marginal comments on the desires of the state with regard to their plans for automation. Such comments were found for only 10 agencies. Five of these have started or plan to start local development; the other five have opted for installation of EIS of CDHS. It can be concluded that 80% on the manual

	<u>Number of Agencies</u>	<u>Extrapolated to 55 Agencies</u>	<u>Agencies Satisfied With Current System</u>
Emission Inventory			
Manual	21 (70%)	39	4 (20%)
Computer	9 (30%)	16	6 (67%)
Air Quality			
Manual	13 (43%)	24	5 (39%)
Computer	12 (40%)	22	7 (58%)
Punch Card	4 (13%)	7	2 (50%)
None	1 (4%)	2	-
Both E.I. and A.Q.	7 (23%)	-	-
System Automated			

Table 2-1. Distribution of Data Systems Used by Agencies

systems will be automated and that one half of these will be converted to EIS and one half will be locally converted. A similar search for air quality systems revealed that of seven agencies indicating plans to automate, five planned for local development and two planned to install AQDHS. It is noted in Table 2-1 that 80% of the agencies employing manual emission inventory systems express dissatisfaction with their current systems and 95% of manual air quality systems are considered unsatisfactory. Thus it is reasonable to conclude that many agencies will automate their data systems in the near future. Insofar as the survey is representative, it can be estimated that there are 39 agencies (of a possible 55) that use a manual emission inventory. Of these, 31 are dissatisfied to the extent that attempts to automate will be (or are) undertaken. Further, about one half will opt for EIS while the rest will develop their system locally. It is believed that this estimate should be modified somewhat by the recent availability of EIS which may increase the proportion of agencies adopting EIS.

Applying the same reasoning to manual air quality systems results in the estimate that 23 of 24 manual air quality systems will be automated and of these 16 will be undertaken by local development and 7 will install AQDHS. These estimates, as in the case of emission inventory systems, should be reconsidered when the availability of the revision to AQDHS is announced.

2.3 GOVERNMENT SUPPORT

Government support is defined to include the facilities provided by NEDS and SAROAD as well as the distribution of information discussing the services available from these systems. Primary information in the area is derived from question 1 and 2 of the survey which deal, respectively, with the distribution of service information pertaining to NEDS, SAROAD and CDHS, and the services available to agencies from these systems.

These questions attempt to determine the extent to which EPA has been able to publicize NEDS, CDHS and SAROAD, the acceptability of the standard reporting formats and the effectiveness of governmental support. Table 2-2 reduces results of the survey as summarized in Charts 1 and 3, Appendix B, to reflect the overall status of governmental support. All responding states indicated that both NEDS and SAROAD capabilities were known. However, knowledge of CDHS has not been so widely disseminated; 53% of responding agencies indicated awareness of the Emission Inventory Subsystem (EIS) of CDHS and 90% indicated knowledge of the Air Quality Data Handling Subsystem (AQDHS) of CDHS. It is noted that official documentation on EIS became available to EPA in November 1973; thus prepublication information distribution has been quite effective.

Two thirds of the state agencies have requested reports from NEDS and over 83% have utilized SAROAD. It appears that state agencies are more familiar with SAROAD than NEDS. Although not a subject of the questionnaire, it is concluded that the greater awareness of SAROAD over NEDS results from

	<u>A</u>	<u>B</u>	<u>C</u>
APTD 1135 - NEDS	100%	67%	43%
EIS/CDHS	53%	-	-
AQDHS/CDHS	90%	-	-
SAROAD	100%	83%	60%

Col A - percent of agencies which have had a system description

Col B - percent of agencies who have used available support services

Col C - percent of agencies aware of all government services available

Table 2-2. Agency Knowledge of Government Support

the longer existence of SAROAD and its consequent greater use than any other factor. It is interesting to note that although 67% of the state agencies responding have made use of NEDS outputs less than half (43%) of the responding agencies felt that they completely understood the services available to them from NADB either directly or through remote terminal facilities available at Regional Offices.

2.4 AUTOMATION CONSIDERATION

2.4.1 Computer Facilities

Question 3 which deals with the subject of the availability of computer facilities is summarized in Table 2-3. The parts of question 3 requesting core size and compilers were included to determine if subsystems of CDHS could be implemented on computers currently available to state agencies. Of the 30 agencies responding, 20 reported having access to one or more computers, 5 of the 30 agencies did not respond to the questions, and only five agencies indicated they had no access to computers (Virgin Islands, Louisiana, Missouri, Hawaii, Guam).

For the 20 computers reported, 15 had adequate core to accommodate CDHS subsystem (EIS and AQDHS) and all of these had the appropriate programming language compilers. Nonetheless, because of the type of computer reported, it was concluded that all facilities having computers could accommodate CDHS. Thus it is concluded that the CDHS concept is viable and that its subsystems can be implemented as desired for most state agencies. It was noted, however, that the 100K byte (or equivalent) core requirement for

operating CDHS subsystems tends to be at the upper range of core allocations as normally made by data processing departments.

Only a small fraction of state agencies have direct control of their computer facilities; most states rely on the facilities provided by another state agency. Over three-quarters of the agencies have adequate computer time for their emission inventory system and 95% report adequate time for their air quality system.

All but one of the states operating computer systems reported having adequate time to run their systems. The exception, New Mexico, reported inadequate time for its emission inventory system. Twenty-four states indicated they had access to adequate computer time for one or more systems. Since there is some question of interpretation of the response given by the remaining agency to the question regarding availability of computer time, it is concluded that all states having access (or potential access) to a computer facility will also be able to arrange for enough time to operate both emission inventory and air quality data systems if they so desire.

2.4.2 Available Computer Based Systems

Nine agencies reported computer based emission inventory system and 12 agencies reported computer based air quality systems. The availability and capabilities of these systems are discussed in Section 2.4.2.1 for emission inventories and in Section 2.4.2.2 for air quality data systems.

REGION	STATE	MAKE	MODEL	CORE	NO. OF TAPES	COMPILER (1)	USAGE (2)	ADEQUATE TIME	
								E	A
I	Connecticut	IBM	370/155	250K	18	C, F	EI, AQ	Y	Y
	Rhode Island	IBM	360/40	110K	4	C		Y	Y
	Maine	Honeywell	6000	256K	12	C, F		Y	Y
	Massachusetts	IBM	370/155	1.5M	5	C, F	AQ	Y	Y
	New Hampshire	not reported						NR	NR
II	Vermont	not reported							
	Puerto Rico	IBM	370/155	700K	6	C, F		Y	NR
	New York	IBM	370/155	500K	NR	C, F	EI	Y	NR
		Burroughs	3500	150K	4	(3)	AQ	NR	Y
	New Jersey	IBM	370/145	750K	NR	C, F	AQ	Y	Y
IV	Virgin Islands	no computer available							
	Florida	Univac	70	130K	6	C, F	AQ	Y	Y
V	Illinois	IBM	370/165	NR	20	C	EI, AQ	Y	Y
	Michigan	IBM	370/155	75K	12	C, F	EI	Y	Y
		CDC	6500	96K	4	C, F	AQ	Y	Y
	Wisconsin	Univac	9400	64K	2	F	EI, AQ	Y	Y
	Minnesota	CDC	3300	230K	4	F	AQ	NR	Y
	Ohio	IBM	370/155	2M	20	C, F		Y	Y
	Indiana	IBM	370/165	7500K	NR	NR		Y	Y
VI	Arkansas	not reported					AQ	N	Y
	Texas	Univac	1106	262K	6	C, F	EI, AQ	Y	Y
	Oklahoma	IBM	370/145	NR	NR	C, F		Y	Y
	Louisiana	no computer available						N	N
	New Mexico	IBM	360	NR	3	C, F	EI, AQ	N	Y
VII	Missouri	no computer available						N	N
	Nebraska	not reported					EI	Y	NR
	Iowa	IBM	370	86K	4	C, F	EI	Y	Y
	Kansas	not reported						NR	NR
IX	California	CDC	3300	96K	6	C, F	AQ	NR	Y
	Nevada	IBM	360	NR	NR	NR		Y	Y
	Hawaii	no computer available						N	N
	Guam	no computer available						N	N

- (1) C indicates ANSI COBOL compiler available
 F indicates ANSI FORTRAN compiler available
 (2) EI indicates computer may be used to support the emission inventory
 AQ indicates computer may be used to support the air quality system
 (3) Does not have ANSI compilers

Table 2-3. Computational Facilities Available to State Agencies

2.4.2.1 Computer-based Emission Inventory Systems

Table 2-4 lists the nine agencies currently using an automated emission inventory system. Three of the agencies use the same system, thus, there are seven different computer based emission inventories reported in this survey. Three of the systems are available on request to the owning agency. One is available from industry. Two states do not offer their system to other users.

Table 2-5 consolidates the basic system characteristics as reported on Form 1, Basic Characteristics of Computer Based Emission Inventory System.

These systems, exhibited the following common characteristics:

- a. card input different from NEDS
- b. data storage on disk
- c. file maintenance capabilities
- d. data edit capabilities
- e. data validation capabilities
- f. production of summary reports
- g. audit trail
- h. support to other functional area

<u>State</u>	<u>System Name</u>	<u>Source</u>	<u>Available from State</u>
Connecticut	IBM STARTER	IBM	no
New York	NY APESMS	NY	yes
Illinois	Ill EIS	Ill	unkn.
Michigan	Mich EIS	Mich	yes
Wisconsin	Wis EIS	Wis	yes
Texas	Tex EIS	Tex	no
New Mexico	NM EIS	NM	no
Nebraska	IBM STARTER	IBM	no
Iowa	IBM STARTER	IBM	no

Table 2-4. Emission Inventory Systems Currently in Use

<u>System Characteristic</u>	<u>No. of Systems</u>
Storage Media:	
Tape	1
Disk	3
Both	2
System Capabilities:	
File Maintenance:	
Card Replacement	
Field Update	
Data Edit	6
Data Validation	5
Emission Calculation	3
Logical Retrieval	4
Report Generation:	
Formatted Set Dump	4
Multiple Report Forms	3
Summary Reports	5
Variable Forms	3
Programming Language:	
ANSI COBOL	2
ANSI FORTRAN	2
BOTH	2

Table 2-5. Characteristics of Computer Based Emission Inventory Systems

Various other capabilities were exhibited by most systems. These included:

- a. emission calculations (3 systems)
- b. logical retrieval (4 systems)
- c. multiple report formats (3 systems)
- d. variable forms (3 systems)

The question of system compatibility with NEDS specifications was addressed in Question 20 and on Form 1 of the questionnaire. The results of these are summarized in Table 2-6. Conflicting responses were received in that only two agencies reported their system output compatible on Form 1, while 6 agencies reported their system completely compatible in question 20. With the exception of one agency system, which had compatibility problems with regard to source classification codes, units of measure and source definition, computer based emission inventory systems are generally compatible with NEDS. However, it was noted that most agencies experienced difficulty in generating their semi-annual reports in the NEDS format. This is believed to arise from a formatting problem rather than from inherent system or data difficulties.

NEDS COMPATIBLE FOR:

SYSTEM				SOURCE		UNITS OF DATA		SOURCE
<u>AGENCY</u>	<u>NAME</u>	<u>INPUT</u>	<u>OUTPUT</u>	<u>IDENT.</u>	<u>SCC</u>	<u>MEASURE</u>	<u>TYPES</u>	<u>DEF.</u>
Connecticut	IBM STARTER	N	Y	Y	Y	Y	Y	Y
New York	NY APESMS	Y*	N	Y	N	N	Y	N
Illinois	Ill EIS	-	-	N	N	Y	Y	N
Michigan	Mich EIS	-	-	N	N	-	-	-
Wisconsin	Wisc EIS	N	Y	Y	Y	Y	Y	Y
Texas	Tex EIS	N	N	Y	Y	Y	Y	Y
New Mexico	NM EIS	-	-	Y	Y	Y	Y	Y
Nebraska	IBM STARTER	N	Y	Y	Y	Y	Y	Y
Iowa	IBM STARTER	N	Y	N	Y	Y	Y	Y

* This response conflicts with other available information

Y: YES

N: NO

-: no response

Table 2-6. System Compatibility with NEDS Specifications

2.4.2.2 Computer Based Air Quality Data Systems

Table 2-7 lists the thirteen automated air quality data system currently in use. Six agencies indicated they would make their system available upon request. Three indicated their systems were not available. The remaining four agencies did not respond. It appears that many of these systems are based upon the original version of AQDHS and were modified by the state agency. Table 2-7 also reflects the fact that all but two computer based systems are compatible with SAROAD.

As can be seen in Table 2-7, there is little difference in the general capabilities available in the air quality data systems currently in use. Significantly, however, two systems do not provide for statistical processing. Only two of the systems produced outputs that were incompatible with SAROAD.

2.5 DISCUSSION OF AUTOMATION OPTIONS

There are three types of data systems available to state agencies which are distinguished by the developing agency (Federal, state, industry). The choice between these systems, should a state decide to automate, rests on factors other than capability or compatibility with Federal centralized systems (i.e., NEDS, SAROAD). These factors include:

- a. development costs
- b. documentation

<u>State</u>	<u>SAROAD Compatible</u>	<u>Available</u>
New York	YES	YES
New Jersey	YES	YES
California	NO	YES
Arkansas	YES	NO
Texas	YES	NO
New Mexico	YES	NO
Massachusetts	YES	YES
Iowa	no response	no response
Florida	YES	YES
Illinois	YES	no response
Michigan	YES	YES
Wisconsin	YES	no response
Minnesota	YES	no response

Table 2-7. Air Quality Data Systems Currently in Use

<u>System Characteristic</u>	<u>Number of Systems</u>
Storage Media:	
Tape	5
Disk	3
Both	5
System Capabilities:	
File Maintenance	12
Data Edit	13
Data Validation	11
Statistical Processing	11
Logical Retrieval	12
Report Generation:	
Formatted File Dump	9
Multiple Reports	10
Summary Reports	12
Statistical Reports	9
Programming Language:	
ANSI COBOL	5
ANSI FORTRAN	3
BOTH	5

Table 2-8. Characteristics of Automated Air Quality Data Systems

- c. system support
- d. training
- e. installation support
- f. system requirements for computer facilities
- g. system performance

2.5.1 AGENCY OPTIONS

The data processing functions of the state agencies for emissions and air quality data can be accomplished in either of two modes; the manual and automated. A decision to employ one or the other depends primarily on:

- a. the size of the data file
- b. file access frequency
- c. data processing/manipulation requirements
- d. funding constraints

For small data files on the order of 100 emission sources or 8-10 air quality monitoring sites, the most obvious choice is the manual mode. This has the advantage of low cost while minimizing the disadvantages associated with manual processing of large files.

For those agencies faced with large data files and the need to frequently reference this data, a decision to automate is most reasonable. In this case a further decision is needed; what means of automation is most

practical? In the areas of emissions and air quality data there are at least five choices; namely:

- o in-house development
- o contract development
- o installation of government provided options
- o installation of industry developed systems
- o installation of system in use to another agency

In-house development has several advantages including:

- o greater assurance that system meets all agency requirements
- o greater assurance that agency personnel can easily maintain the system and modify it as requirements change

There are disadvantages that must also be considered. These include:

- o large, but temporary personnel requirements during the development phases
- o relatively large development costs
- o long lead time to accommodate system analysis and development
- o requirement to produce system documentation and manuals.

The advantage for contracting system development tend to parallel those for in-house development. Additional advantages include:

- o elimination of large staff requirement during development
- o minimum development time
- o improved documentation

Contrasting possible disadvantages include:

- o relative costs
- o need to delegate staff to coordination during development
- o need to develop formal, detailed system specifications
- o some loss of flexibility during development

The availability of systems provided by the government offer many advantages to the agencies. Included among these are:

- o elimination of development costs
- o assurance that system is compatible with government requirements
- o reduced installation costs
- o available documentation
- o short lead time for installation

The disadvantages may include installation difficulties and system inflexibility with regard to unusual agency requirements. The effect of these could be reduced if the government undertakes a program of system maintenance, installation support and training. The choice of installing systems available from industry could be good provided the system is compatible with agency needs. Such systems are generally offered with full documentation. Installation support and training are usually available.

Another source of developed systems is found in the system currently in use and made available by some state agencies. These have the advantages that they exist and are available without development cost. They may not, however, meet all agency needs. Disadvantages may be caused by system constraints, installation problems, system maintenance, possibly poor documentation, and lack of training programs. The explicit capabilities and support programs should, of course, be examined prior to selecting one of the systems that are currently in use.

Section 3. ANALYSIS FOR EMISSION INVENTORY SYSTEMS

3.1 SCOPE OF THE ANALYSIS

This section discusses the findings deduced from the survey questionnaires as they apply to manual and computer based emission inventory systems.

Emphasis has been placed on:

- a. Identifying techniques used for the storage, access and maintenance of these systems.
- b. Identifying problems associated with the routine use of these systems.
- c. Identifying problems arising at state agencies in meeting Federal reporting requirements.
- d. Identifying techniques or systems available to state agency that might ameliorate their emission inventory problems.

3.2 STORAGE, ACCESS AND MAINTENANCE

3.2.1 Sources of Emission Inventory Data

The questionnaire (question 8) suggested several different sources of data for emission inventories. The responses from the state agencies as summarized in Table 3-1 showed a preference for multiple sources to include permit or registrations and questionnaires. However, this tendency was most pronounced for states with manual systems. The responses suggest that the most common basic sources of emission inventory data consist of permit or registration forms.

<u>Source Form</u>	<u>Manual Systems</u>	<u>Computer Based Systems</u>	<u>Total</u>
Permit/registration	7	3	10
Inspection Reports	0	1	1
Questionnaires	2	3	5
Multiple Sources	12	2	14
TOTAL	21	9	30

Table 3-1. Emission Inventory Data Sources

3.2.2 Storage Techniques

Storage techniques were addressed primarily by question 7 and 9 for manual system and by question 9 and Form 1 for computer based systems. Table 3-2 summarizes the results obtained from these questions. States having computer based systems used standard storage techniques using tapes and disks. For states having manual systems, the predominant technique is the storage of original source forms in standard file cabinets. A significant number (26%) used NEDS forms as storage media. Manual systems accommodated 5000 or fewer sources except for one agency having 100,000 sources. However, 70% of such systems handled less than 1000 sources and 53% handled less than 500 sources. The range in the number of sources is from 20 to 100,000; the average size, excluding extremes is about 450 sources.

Computer based systems accommodated more sources than manual systems. More than 57% of the automated systems have more than 5000 sources and 86% have more than 1000 sources. The range of the number of sources in computer system is from 300 sources to 150,000 sources.

Material in the manual files is apparently stored by alphabetic or numeric coding schemes of local design. Storage for computer based systems is controlled by source identification. Codes included may be numeric or alphabetic or a combination. It appears from the survey that manual systems identify sources to the facility level whereas computer based systems usually employ more detailed identification control. Information from sources other than the survey suggest that computer based systems have the

<u>Storage Characteristic</u>	No. of Agencies	
	Manual	Computer
Separate Files	14	-
Mixed Files	4	-
Volume:		
0-1 file drawers	5	-
2-5 file drawers	3	-
6-12 file drawers	2	-
12 file drawers	3	-
Storage Media:		
Permit/Register Forms	10	-
Local E.I Forms	4	-
NEDS Forms	5	-
Number of Sources:		
0-500	9 (53%)	1 (14%)
500-1000	3 (18%)	0 -
1000-5000	4 (23%)	2 (29%)
10,000-20,000	0 -	3 (43%)
100,000	1 (6%)	1 (14%)

Table 3-2. Emission Inventory Storage Characteristics

capability to identify sources of pollutant down to the level of an individual fuel. However, in these cases storage is usually maintained at the "point" level; that is, to the level equivalent to a stack.

The storage and protection of confidential data does not seem to be a problem. Table 3-3 summarize the responses in this regard for manual and computer based systems respectively. Only 16 of the 30 agencies responded to the question on confidentiality. Of these 16, nine reported that no confidential data was stored. Simple protective devices such as locked files are used to protect confidential data.

Manual storage techniques included:

- a. Notebooks of NEDS Forms
- b. File drawers containing source forms in alphabetic or numeric order
- c. NEDS listing of point sources

Computer based systems stored data on disk or tape and used alphabetic or numeric sorting of coded identification keys to maintain file sequence.

3.2.3 Access Techniques

Access techniques used to extract data from manual files are inferred from experience and related to the use of emissions data as reported in the survey form. Access to manual emission inventories are by manual file search. Alphabetic or numeric coding schemes for source identification are used by most agencies.

<u>Amount of Confidential Data</u>	<u>No. of Agencies</u>		<u>Total</u>
	<u>Manual Systems</u>	<u>Computer Systems</u>	
none	4	5	9
1-2%	-	1	1
2-4%	-	1	1
4-6%	2	2	4
6%	1	-	1
no response	14	0	

Table 3-3. Summary of Agencies Storing Confidential Data

Two thirds of the computer based systems were reported to have a logical retrieval capability. Thus most of these systems have the capability to select one or more sources from the file as a function of some predetermined criteria. These criteria may be source identification, level of pollutant emission, source location, or other factors of immediate interest. A few (probably 2) computer based systems are restricted to summary reports and a formatted listing of the file content. Table 3-4 contains a summary of the retrieval and report generating capabilities available in existing systems. This summary together with individual Form's 1 were used to infer the access techniques available in computer based emission inventory systems.

3.2.4 Maintenance Techniques

Techniques used to maintain emission inventories are summarized in Table 3-5 based on responses to questions 12 and 13 of the survey. A review of the table shows that the concepts for file maintenance are the same for both manual and computer based systems. Two such concepts are apparent. The predominant technique is to replace the entire contents (or a significant portion thereof) of a source record whenever one or more data elements of that record are changed as a result of an inspection, new permit application or some other factor. This technique is employed by 14 of the 16 manual systems reported and for 6 of the nine computer based systems.

The alternative technique is to change only the data element affected. For manual systems this is accomplished by correcting individual data fields. In computer based systems the data record is retrieved, the data element is changed and the record replaced in the file.

	<u>No. of Systems</u>
Access:	
Logical Retrieval	4
Reports:	
Formatted File Dump	4
Multiple Reports	3
Summary Reports	5
Variable Forms	3

Table 3-4. Access Techniques and Report Generation Capabilities
for Computer Based Emission Inventory Systems

<u>Techniques</u>	Type of System	
	<u>Manual</u>	<u>Computer</u>
Form Replacement	14	-
Form Correction	2	-
Record Replacement	-	6
Field Level Update	-	3
<u>Maintenance Frequency</u>		
Annual	4	4
Semi-Annual	7	2
Weekly	0	2
As received	6	1

Table 3-5. Emission Inventory Maintenance Factors

Only 3 agencies (of 21) having manual systems reported that a record of changes made (i.e., an audit trail) was maintained. The remaining agencies did not respond. If an audit trail is not maintained a problem can arise while generating responses to the periodic reporting requirements since these reports are based on reporting changes in the emission inventory.

On the other hand, a complete audit trail of changes, deletions and additions of data elements and data records is maintained by all computer based systems reported. There was, however, no indication that the audit trail was specifically related to Federal reporting requirements. It is believed that these audit trails are made more for the purpose of verifying individual file maintenance activities than for insuring better response to reporting requirements.

3.3 SIGNIFICANT PROBLEMS

There were no significant problems related to routine use or to Federal reporting that could be associated in general with all reporting agencies. However, it was clear that a few state agencies were experiencing severe problems in several areas. Perhaps the greatest problem has arisen in those state agencies whose emission inventory was developed before NEDS specifications became available. In some instances data storage concepts were developed that turned out to be significantly different from the NEDS specifications. This has created problems both in normal use and maintenance

of emission inventories as well as in the generation of Federal reports. Major differences were reported by 17 agencies for such key data elements as:

- o Source identification (5 systems)
- o Source classification codes (6 systems)
- o Units of measure (5 systems)
- o Types of data (7 systems)
- o Definition of a source (6 systems)

Such incompatibilities suggest major problems by imposing a need to maintain and use special procedures such as:

- o Maintaining cross references for sources, source classification codes, units of measure, and previous changes
- o the addition of data elements not specified by state rules
- o the addition of data elements required by the state solely to satisfy Federal reports

These activities place a burden on daily maintenance operations as well as on the generation of Federal reports.

The selection of reportable sources is further complicated by the fact that a source must be reported only if it emits at least 25 tons/year and is part of a facility that emits at least 100 tons/year of a pollutant.

Progress in air pollution control tends to reduce emissions below the reporting criteria. Other factors, such as the current fuel crisis, tend to increase emissions above the criteria. Since these factors will be active in the future, significant inventory changes will occur and the difficulties in identifying reportable sources can be expected to increase substantially.

The number of sources maintained by state agencies generally exceeds the number of sources that must be reported to NADB. As shown in Table 3-6 the major impact of this is the need to develop procedures to select the appropriate sources which are limited (Federal Register, Vol 38, August 3, 1973) for a reporting period to:

- a. Those sources coming into compliance with a control regulation
- b. New or modified sources
- c. Discontinued sources.

In the manual systems the problem is resolved by noting changes according to the above criteria as they occur. For computer based systems the problem may be resolved by periodically selecting those sources whose "date of entry" lies within the reporting period.

<u>Range of Excess</u>	Number of Agencies		<u>Total</u>
	<u>Manual Systems</u>	<u>Computer Systems</u>	
0-200 sources	10	2	12
200-500 sources	2	0	2
1000-5000 sources	3	1	4
5000 sources	2	2	4
Total	17	5	22

Table 3-6. Number of Agencies Maintaining Files That
Exceed the Number of Sources in NEDS

The foregoing problem areas were inferred from the responses to several questions which relate to various aspects of size, content, and compatibility of emission inventory files. It is interesting to note, however, that only four agencies reported any anticipated impact due to federal reporting.

Those agencies that anticipated an impact reported only a slight effect on overall manning. Thus, unless circumstances change drastically, it must be concluded that state agencies anticipate little or no problem in meeting Federal reporting requirements for emissions data. This conclusion may not be representative in its application to agencies having manual systems since only about one third reported having experience in generating a semiannual report.

Table 3-7 was constructed from the responses to question 19 which asked if the agency had submitted emissions data and the NEDS report monitor status report of September 10, 1973 (Annual Pollutant Monitoring Summary, Year 1972). Comparable data in the sense that data for the same number of agencies were provided from both sources were available for four of the seven regions in the survey. The table shows the number of agencies that have submitted emissions data, the number of agencies whose data was submitted by contractors and the total number of agencies submitting data as reported in the survey. The remaining data in the table shows the number of agencies for which there is emission data in NEDS and the number of agencies for which data is expected.

<u>Region</u>	<u>Survey Results</u>		<u>Total</u>	<u>NEDS Report Monitor Results</u>	
	<u>Data Submitted By Agency</u>	<u>Contractor</u>		<u>Data In NEDS</u>	<u>Data Expected</u>
II	2		2	1	2
V	3		3	6	6
VI	1	3	4	5	5
VII	1	1	2	1	4

Table 3-7. Count of Agencies that have Submitted Emission Data
as Reported by the Survey Compared with NEDS Content

There is no agreement between the numbers obtained from the survey and those obtained from the NEDS report. It is believed that this lack of agreement reflects some misunderstanding of reporting requirements since, in three of the four regions, more states believe their emissions data had been submitted than are recognized as data submitters by NEDS.

Some of the differences between the expected and actual data submittals is believed to reflect the current static nature of agency inventories. Consequently agencies may be under the impression that emissions data submittals are not needed because of lack of changes in their inventory.

Section 4. ANALYSIS FOR AIR QUALITY DATA SYSTEMS

4.1 GENERAL COMMENTS

Air quality data systems were reported for twenty-nine of the thirty respondents. One agency did not operate any air quality measuring sites and relied entirely on NASN stations operated by EPA. Three types of air quality data systems were described as follows:

- o 13 manual systems
- o 12 computer based systems
- o 4 punched card systems

All but one agency, that is 97%, have submitted air quality data in SAROAD formats. The responses to question 29 dealing with quarterly report tend to reflect more compliance with reporting requirements than is shown by the internal EPA report monitoring system. Where comparable numbers were available, the values from the NADB report monitor were uniformly smaller than the survey numbers as shown in Table 4-1.

Table 4-1 shows that in only one region of the regions for which comparable information is available did the NADB report monitor count agree with the count obtained in the survey. The differences are inexplicable from the information available. It is suggested that there is some misunderstanding of the definition of the quarterly report and, if so, further efforts by EPA to clarify these requirements is in order.

No. of States Submitting One or More Quarterly Reports As Shown By		
<u>Region</u>	<u>Survey</u>	<u>NADB</u>
I	5	3
II	2	2
V	6	4
VI	5	4
VII	4	4

Table 4-1. Count of Agencies that have Submitted as Reported
by Survey Compared to SAROAD Content

The subject of compatibility between agency air quality system and SAROAD is considered in various survey questionnaires and specifically in question 30, all of which are summarized in Table 4-2. All evidence leads to the conclusion that at least 90% of agency systems are fully compatible with SAROAD. The difficulties encountered by NADB in accepting air quality data seems to lie in formatting difficulties rather than any inherent system problems. As shown in Table 4-2 the SAROAD forms predominate as source forms for collecting and storing air quality data. This implies that both manual and computer based systems maintain appropriate data in proper formats to be SAROAD compatible. Table 4-2 indicates that SAROAD forms and punched card formats predominate (in 26 of 29 cases) as the preferred method of submitting air quality data.

Manpower requirements for operating air quality data systems are relatively constant from state to state regardless of such factors as frequency of use, and data volume, but do depend on type of system. There is a tendency to require more personnel to maintain a computer based system than for a manual system. Table 4-3 reflects this tendency in that about 63% of the manual system are operated by one person while 80% of the computer based systems require 1-3 people. This is expected in view of the data summarized in Table 4-4, which shows, on the average, that computer based systems handle data from 132 sites sources while manual systems handle data from 70 sources. The type of resources required is somewhat different in that computer based systems require programming skills in addition to data collection skills.

	<u>Number of Agencies Reporting</u>			
	<u>Type of System</u>			
	<u>Manual</u>	<u>Computer</u>	<u>PC</u>	<u>Total</u>
Air Quality Source Forms:				
SAROAD	10	6	4	20
OTHER	3	6	0	9
Submission on SAROAD Form:				
YES	13	11	4	28
NO	0	1	0	1
Agency File is Compatible:				
With SAROAD:				
YES	12	11	3	26
NO	1	1	1	3
Method of Submitting AQ Data:				
SAROAD Form	10	0	2	12
SAROAD Cards/Tape	3	9	2	14
OTHER	0	3	0	3

Table 4-2. Compatibility Factors for Agency Air Quality Data Systems

<u>Manpower Range</u> <u>(man/years)</u>	<u>Number of Agencies Reporting</u>		
	<u>Type of System</u>		<u>Total</u>
	<u>Manual</u>	<u>Computer</u>	
0-1	7	0	7
1-3	3	8	11
3-5	0	1	1
5-10	1	0	1
10	0	1	1
Total	11	10	21

Table 4-3. Manpower Requirements for Air Quality Data Systems

	TSP			SO ₂ DAILY			SO ₂ HOURLY			NO ₂ DAILY			NO ₂ HOURLY			CO HOURLY			OX HOURLY			TOTAL SENSORS			
	REQ	PRO	RPT	REQ	PRO	RPT	REQ	PRO	RPT	REQ	PRO	RPT	REQ	PRO	RPT	REQ	PRO	RPT	REQ	PRO	RPT	REQ	PRO	RPT	TYP
Conn	19	67	25	11	4	5	5	24	0	10	22	4	0	2	0	5	6	0	5	7	0	46	139	12	PC
RI	7	25	23	5	21	18	2	4	2	6	25	17	0	0	2	0	4	2	0	4	0	20	83	64	M
Maine	13	22	6	10	22	6	3	3	3	0	0	1	0	0	0	0	0	0	0	0	0	26	48	6	M
Mass	34	63	52	21	66	95	9	22	0	16	62	52	0	7	0	6	11	0	6	12	0	92	243	199	C
NH	8	32	25	7	13	4	2	4	0	0	13	4	0	0	0	0	2	0	0	1	0	17	65	33	M
Ver	4	10	2	4	3	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	9	22	2	M
PR	3	22	5	3	3	4	1	19	0	0	19	4	0	0	0	0	1	0	0	0	0	7	64	13	-
VI	3	6	4	3	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	10	6	M
NY	72	336	228	39	11	34	19	79	15	26	28	8	0	0	10	13	29	10	19	23	8	188	506	313	C
NJ	19	50	78	13	5	8	7	22	20	7	8	8	0	0	4	8	22	20	7	7	3	61	114	141	C
FLA	30	30	39	16	16	22	5	6	4	20	20	20	0	0	2	0	0	3	4	3	2	75	75	92	C
Ill	56	125	54	37	50	37	16	32	1	12	16	4	0	11	1	10	16	0	10	12	1	141	262	98	C
Mich	29	127	108	19	36	24	8	27	18	21	36	6	0	5	0	0	10	0	0	5	0	77	246	156	C
Wis	24	74	7	8	30	3	1	9	0	10	8	3	0	6	0	0	9	0	4	11	0	47	147	14	C
Minn	27	68	57	16	20	16	6	12	2	10	10	14	0	3	1	4	4	2	0	5	1	63	122	93	C
Ohio	78	255	128	40	94	66	15	46	5	45	95	66	0	34	3	0	24	5	16	24	6	194	572	279	M
Ind	45	124	117	28	89	57	10	32	4	13	70	47	0	0	0	4	7	0	4	7	1	104	329	226	M
Ark	9	29	30	4	6	2	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	14	36	34	C
Texas	52	221	160	37	171	13	12	61	0	27	0	13	0	79	0	1	79	0	19	81	0	148	692	186	C
Okla	24	98	90	7	15	25	0	3	0	0	0	18	0	0	1	0	4	2	4	4	2	35	124	138	PC
LA	5	9	11	10	13	17	5	6	0	0	0	4	0	0	0	0	0	0	5	6	2	25	34	34	M
NH	16	52	26	8	22	5	1	5	0	0	18	5	0	0	0	1	3	1	3	3	1	29	103	38	C
Neb	12	29	36	6	6	2	1	1	0	6	7	3	0	0	0	0	0	1	0	0	1	25	43	43	PC
Kans	34	59	57	6	36	28	0	2	3	0	25	28	0	1	2	1	5	3	3	5	2	44	143	123	M
MO	39	75	46	11	6	3	4	11	1	7	4	4	0	12	1	6	13	1	6	13	1	64	134	57	PC
Iowa	33	44	26	12	13	2	1	3	0	2	4	2	0	0	0	0	1	0	2	2	0	49	67	30	M
Calif	65	102	18	15	7	15	2	23	16	30	12	15	0	54	47	28	57	46	32	81	63	172	346	220	C
Nev	13	34	41	6	6	3	2	2	0	5	5	0	0	3	2	2	2	1	2	3	1	30	55	48	M
HA	3	12	14	1	8	12	0	1	0	0	9	11	0	0	0	0	2	1	0	2	1	4	34	39	M
Guam	1	2	3	3	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	6	5	M

The data in this table was extracted from NADB status report Summary of Monitoring Activity, October 9, 1973

Table 4-4. Summary of Required, Projected and Reporting Sensor Sites for Various States

The degree of satisfaction with air quality data systems expressed by state agencies is similar to that expressed for emission inventory systems. That is agencies with computer based systems tended to be satisfied while agencies with manual systems tended to be dissatisfied. About 65% of agencies with automated systems were satisfied while only 40% of those with manual systems were satisfied.

4.2 STORAGE, ACCESS AND MAINTENANCE OF AIR QUALITY DATA

Questions 24, 25, 27, 28 and 29 as summarized on Charts 23, 24, 25, 26 and 27 of Appendix B provided specific inputs to the subjects of storage, access and maintenance of air quality data. Discussion of these topics is given for each area in the following subsections.

4.2.1 Storage Concepts

The sources of data for air quality data systems are similar for both manual and computer based systems as reflected in Table 4-5.

About 69% of all agencies rely on SAROAD forms as a means of recording air quality data and providing such data to air quality data systems. SAROAD forms are used predominantly (77%) for manual systems, entirely for punched card systems and for 50% of computer based systems.

	Number of Agencies Reporting		
	<u>Local Forms</u>	<u>SAROAD Forms</u>	<u>Total</u>
Manual Systems	3	10	13
Computer Based Systems	6	6	12
Punched Card Systems	0	4	4
Total	9	20	29

Table 4-5. Source of Air Quality Data

Data storage characteristics are summarized in Table 4-6. Manual and punched card systems used the same concept which consisted simply of filing the original data source forms. Five of the thirteen computer files were restricted to tape storage, three were restricted to disk and the remainder used both tape and disk storage. Air quality data is stored indefinitely, however, some agencies (about 20%) keep an active file for one to two years putting the older data in an history file. To date the agencies have collected data requiring not more than 3 file cabinets for their storage, and for most agencies (80%) less than 1 cabinet. Currently, therefore, the storage of air quality data does not present a problem for manual systems.

The accumulation of air quality data for manual systems may become a significant problem in the future. An estimate of the magnitude of the problem was developed from the data presented in the NADB status reports, summary of monitoring activity dated October 9, 1973.

A rough estimate of the number of sensor sites is derived from the number of projected particulate sites (TSP) with the assumption that other sensors are located with at least one particulate site. Although it is known that other pollutants are separately measured, the estimate is useful for speculating about the impact on agency operations due to the measurement program.

	Number of <u>Agencies</u>
<u>Period of Storage - Active File</u>	
Indefinite	22
1-2 years	6
<u>Storage Media</u>	
SAROAD Forms	10
Agency Forms	3
Punched Cards	
Tape/Disk	
<u>Storage Volume</u>	
0-2 File Drawers	8
3-6	1
6-10	1

Table 4-6. Air Quality Data Storage Summary

Using the estimate as described it is estimated that agencies having manual systems operate an average of 49 sites as opposed to 104 sites for computer based systems.

It is further assumed that each site will generate on the average one SAROAD (or equivalent) form per day to record the sensor data. Thus the manual storage system will grow at a rate of about two file drawers per year.

$$\frac{(49 \text{ sites} \times 365 \text{ days/year} \times 1 \text{ page/site/day})}{9000 \text{ pages/file drawer}} = 1.99 \text{ file drawers/year}$$

This estimate agrees reasonably well with the volumes of storage summarized in Table 4-6. The rate of growth for manual systems indicates a growth problem that would be best resolved by automating.

4.2.2 Access Methods

The questionnaire was designed so that access to air quality data files could be inferred from question 26 and Form 2. Unfortunately insufficient information was received in response to question 26, dealing with report generation, to make valid inferences with confidence. However, the response in general were reviewed to infer that access techniques for manual systems must depend on a file structuring such that measurements of pollution concentration are filed sequentially by date, for each observing

site. This, of course, reflects the method used to collect data for storage as discussed in Section 4.1.1. Access is then accomplished by scanning through the files for a site until the times desired are found. Data for pollutants desired is then extracted and processed as required.

Access to manual air quality data files may become a significant problem in the near future because of the need to reconsider state implementation plans with respect to social political and economic crises, such as the current fuel shortage, which require access to air quality files for impact studies.

Access to automated air quality data files does not present significant problems. The access techniques reported on Form 2 for all computer based system employed a logical retrieval which presumably allowed selection of data based on several criteria. The criteria probably included location, time and pollutant as a minimum thereby exhibiting a high degree of compatibility with AQDHS. File access for studies, reports or summaries does not represent a problem in computer based systems.

4.2.3 File Maintenance Procedures

File maintenance for air quality data files consists of two major functions which are considered for this survey. The functions are the addition of data and the modification of data in the file. Both of these functions, of course, require file access techniques, and, as discussed in Section 4.1.2 can therefore create problems for manual systems in particular.

The addition of data is the lesser problems because, in general, the technique simply adds a form behind a series of forms at a visually indicated position (e.g., a file separator). On the other hand, changing a data value involves a file search to locate a particular form, the correction of a specific entry and re-positioning of the form in the file. This can be a rather lengthy and error prone task particularly for large files.

The file maintenance procedures differ somewhat in frequency between manual and computer based systems. As shown in Table 4-7, there is a noticeable tendency to update manual files continuously whereas computer files are predominantly maintained in a batch mode at some time interval ranging from one week to one month. These techniques probably reflect the handling characteristics of data files more than any other factor.

File Maintenance Interval	<u>Number of Agencies Reporting</u>		<u>Total</u>
	<u>Type of System</u>		
	<u>Manual</u>	<u>Computer</u>	
As received	6	2	8
1 week		3	3
1 month	3	7	10
3 months	2		2
Total	11	12	23

Table 4-7. Air Quality File Maintenance Summary

APPENDIX A

SAMPLE SURVEY QUESTIONNAIRE

Emission Inventory

Air Quality

Data System Survey

The attached forms are forwarded to aid in the collection of basic planning information related to emission inventory air quality data systems used at the state and local government levels. The information gathered will be used by EPA internally to evaluate the status of such systems and to ascertain:

- a. Techniques presently used to store, access and maintain emission inventory and air quality data files
- b. Significant problems associated with maintaining and using such files
- c. Anticipated problems in meeting the proposed Federal regulations for the quarterly and semi-annual reporting of emissions air quality data by state agencies, especially as related to providing data in the NEDS format
- d. Availability of computer based systems and other considerations for maintaining and using state and local agency data systems.

The survey addresses the above problems in some detail as covered by the attached questionnaire. The questions are grouped in three categories:

- a. Those applicable to emission inventory system
- b. Those applicable to air quality data system
- c. Those applicable to both systems

The basic intent is to obtain information to describe the scope and the size of state systems; to identify problems associated with the use of the systems to meet Federal reporting requirements. Thus it is important to note that the systems of interest exclude data collection functions which are concentrating on storage, retrieval, and report generation. This is a particularly important distinction in the air quality system since air quality monitoring involves many functions related to data collection.

Questionnaires have been designed as guides for collecting relevant information. Different regions will have different questionnaires. Most of the questions are of the multiple choice type. The multiple choices are believed to be reasonably comprehensive, however, the use of remarks is encouraged to record circumstances not adequately described.

You are requested to complete one set of questions for each state within your region. It is suggested that questions whose answers are readily known be completed first and that answers to the remaining questions be reserved for a later time. This will provide for a directed search of the various sources from which the desired information can be obtained.

In order to meet contractual schedules, you are requested to return the completed forms to NADB within ten (10) days of receipt at your office. However, in order to speed the analysis, we would appreciate your returning the questionnaire sooner if possible. The mailing address is:

Dr. James R. Hammerle
Environmental Protection Agency
National Air Data Branch
Research Triangle Park, North Carolina 27711

1. Has the agency received

- | | | | |
|----|--|-----|----|
| a. | Guide for compiling a Comprehensive
Emission Inventory APTD 1135? | YES | NO |
| b. | Documentation or briefing on the
Emission Inventory Subsystem (EIS)
of Comprehensive Data Handling
System (CDHS) | YES | NO |
| c. | Documentation or briefing on the
Air Quality Data Handling System
(AQDHS) of CDHS | YES | NO |
| d. | Documentation or briefing on the
Storage and Retrieval of Aerometric
Data (SAROAD) system | YES | NO |
| e. | Approval for submitting data on locally
devised forms in accordance with para-
graph 5.1.7 (3) of the Federal Register,
Vol. 38, Aug. 3, 1973 | YES | NO |

2. a. Has the state agency requested reports
or data from

- | | | | |
|----|--------|-----|----|
| 1) | NEDS | YES | NO |
| 2) | SAROAD | YES | NO |

b. Does the state agency know what reports
data and data summaries are available
upon request from

- | | | | |
|----|--------|-----|----|
| 1) | NEDS | YES | NO |
| 2) | SAROAD | YES | NO |

3. What are the basic characteristics of the computer facility available to the agency for the emission inventory and air quality systems?

- a. Same computer is used for both systems
- b. Different computers are used for each system
- c. List characteristics in following table

<u>Characteristics</u>	<u>Emission Inventory</u>		<u>Air Quality</u>	
Make				
Model				
Core Size				
No. Tape Drives				
<hr/>				
ANSICOBOL	YES	NO	YES	NO
<hr/>				
ANSIFORTRAN	YES	NO	YES	NO
<hr/>				
d.	Does the agency control (or own) the computer?		YES	NO
	If NO; who controls the computer? _____			
<hr/>				
e.	Does the agency have access to enough computer time to operate its			
1)	Emission inventory system?		YES	NO
2)	Air quality data system?		YES	NO

4. What type of emission inventory system does the state agency use?

- a. Manual
- b. Uses punched card equipment
- c. Computer based. If so, please complete the accompanying form (Form 1).
- d. If computer based, would state make system available to other states?

YES NO

5. If the agency uses a computer based system, does the system produce reports (or outputs) compatible with NEDS and SAROAD/formats?

a. NO

b. YES, as follows

NEDS

SAROAD

Printed list

Punched cards

Magnetic tape

c. Yes, with exceptions listed below.

NOTE: 1. NEDS compatibility infers ability to produce output in the format of the NEDS forms (See Guide for Compiling a Comprehensive Emission Inventory, PATD 1135)

2. SAROAD compatibility infers the ability to produce output in the format of the SAROAD SITE and DATA transaction forms. (See SAROAD, Users Manual USEPA, OAP, APTD 0063)

d. Is data edited

1. manually	YES	NO
2. by computer technique	YES	NO

6. If the emission inventory system is computer based, does the system have the flexibility to produce reports specifically related to air pollution control management problems such as:

- o Inspection activities
- o Permit (or equivalent) activities
- o Enforcement activities
- o Complaints
- o or Scheduling

a. No - there is no automated scheme to relate emissions data with functions

b. There is an automated scheme to extract selected data from the emission inventory data file for special purposes

7. If the emission inventory is manual:
- a. Is the inventory data stored separately from other data?
YES NO
 - b. In what form is the data stored:
 - 1. Originals or copies of source forms
 - 2. Other agency forms
 - 3. NEDS forms
 - 4. Other (Specify)
 - c. What is the approximate volume of storage?
 - 1. _____ file drawers
 - 2. _____ other (specify)
8. What is the source of data that becomes the emission inventory?
- a. Permits, registration, certifications or equivalent
 - b. Inspection reports
 - c. Questionnaires
 - d. Other (specify)
9. How many point emission sources are kept in the state emissions inventory file considering that a source is the equivalent of a permit record or a NEDS form?
- a. _____ sources
10. a. How are area sources recorded?
- 1. County
 - 2. UT GRID (give dimensions of grid) _____
 - 3. Other (specify)
- b. How many such sources are kept?
- _____

11. List descriptive title and frequency of reports regularly prepared from the emission inventory data. List distribution for those used outside of the state.

12. a. How frequently is the emission inventory file updated?
(Indicate average number of transactions)

1. As received for a total of _____ transactions per _____

2. Daily in batches of _____ transactions

3. Weekly in batches of _____ transactions

4. Monthly in batches of _____ transactions

5. Other (Specify)

b. Is an audit trail maintained to record

1. Additions	YES	NO
--------------	-----	----

2. Changes	YES	NO
------------	-----	----

3. Deletions	YES	NO
--------------	-----	----

13. How are changes made to the emission inventory file?

If Manual System

If Computer Based

a. by replacing entire forms

d. record replacement

b. by correcting forms

e. field replacement

c. other (specify)

f. other (specify)

14. How long is an emission inventory file entry retained in the active file?

a. Indefinitely

b. Until changed

1. Original data is discarded	YES	NO
-------------------------------	-----	----

2. Original data is placed in history file	YES	NO
--	-----	----

15. What are the provisions for protecting confidential or proprietary emissions data?
- No confidential data are stored.
 - There are no provisions for isolating confidential data within the files.
 - Approximately _____% of the sources contain confidential information.
 - Briefly describe technique used to protect and handle confidential data.
16. a. How many man years per year are needed to maintain the emission inventory system? _____
- b. If a computer based system is used:
- How many programmer man years are normally needed to work on the inventory? _____
 - How many of these programmers can use
 - COBOL _____
 - FORTRAN _____
 - Other (specify) _____
- c. 1. Are people employed with the prime function of collecting emission inventory data (do not count inspectors or engineers whose functions incidentally provide emissions inventory data). _____
2. If so, how many? _____

17. When semi-annual emission inventory reports are due to EPA, is it necessary to temporarily increase the staffing level above that normally involved in the emission inventory system?
- a. No
 - b. Yes, then
 - 1. What is the percentage of increase? _____
 - 2. What is the manning increase? _____
 - 3. What is the impact of this increase on other agency activities? _____
18. What procedure does the agency use to transmit semi-annual emission inventory reports to the EPA regional office?
- a. Annotation of the emission inventory list provided to the agency by EPA
 - b. List (or collection of agency forms) containing the required information
 - c. NEDS forms
 - d. Punched cards in NEDS format
 - e. Magnetic tape in NEDS format
 - f. Other (specify)
19. a. Has the agency submitted a semi-annual emission inventory report in NEDS format
- YES NO
- b. If NO, why not?

20. Is the data in the agency's emission inventory compatible with:
- | | | | |
|----|--|-----|----|
| a. | All elements of the NEDS reporting format? | YES | NO |
| b. | NEDS source identification system? | YES | NO |
| c. | NEDS source classification code system? | YES | NO |
| d. | NEDS units of measurement? | YES | NO |
| e. | NEDS requirements for types of data? | YES | NO |
| f. | NEDS definition for a point source? | YES | NO |
| g. | Briefly describe other significant problems arising from the requirement to prepare the semi-annual report in NEDS format. | | |

21. Does the agency consider the emission inventory system generally adequate and efficient for meeting internal agency needs:

- a. Yes
- b. Yes, for most purposes
- c. Yes, for a few purposes
- d. No

Comments:

22. What type of system does the state agency use for storing and processing air quality data
- a. Manual
 - b. Uses punched card equipment
 - c. Computer based. If so, please complete the accompanying form (Form 2).
 - d. If computer based, would the state make systems available to other states?
 1. Yes
 2. No
23. Is data edited
1. Manually?
 2. By computer technique?
24. If a manual air quality system is used:
- a. Is the air quality data stored separately from all other data

YES NO
 - b. In what form is the data stored?
 1. Originals or copies of source forms
 2. Other agency forms
 3. Other (specify)
 - c. What is the approximate volume of storage?
 1. _____ file drawers
 2. _____ other (specify)

25. What is the source of data for the air quality system?
- a. SAROAD forms
 - b. Local agency forms
 - c. Other (specify)
26. List descriptive title and frequency of report that are regularly prepared from the air quality data. Indicate distribution for those used outside of the state.
27. How frequently is the air quality data file updated? (indicate number of transactions)
- a. As received for a total of _____ transactions per _____
 - b. Daily in batches of _____ transactions
 - c. Weekly in batches of _____ transactions
 - d. Monthly in batches of _____ transactions
 - e. Other (specify)
28. How long are air quality measurements kept in the active file?
- a. Indefinitely
 - b. Until periodic summaries are available, the summarized data are transferred to inactive (or history) file.
 - c. Until periodic summaries are available, then summarized data are purged from the file
 - d. For _____ years, then transferred to inactive (or history) file
 - e. Other (specify)

29. a. Has the agency submitted air quality data in the SAROAD formats?

YES NO

b. If NO, why not?

30. a. Is the data in the agency's air quality data file compatible with all elements of the SAROAD site and data reporting forms?

YES NO

b. If the answer to this is NO, briefly describe significant problems arising from the requirement to report air quality data in the SAROAD formats.

31. What procedures does the agency use to transmit quarterly air quality reports to EPA regional offices?

a. SAROAD transaction forms

b. SAROAD transaction cards

c. Other (specify)

32. a. Considering only the filing, file maintenance, data processing or compilation and report generation functions, how many man years per year are employed to operate the air quality data system?

b. If a computer based system is used:

1. How many programmers are regularly available to work on the air quality system? _____

2. How many of these programmers use:

(a) COBOL _____

(b) FORTRAN _____

(c) Other (specify) _____

33. Does the agency consider its air quality data handling procedures generally adequate and efficient for meeting internal agency needs?

- a. Yes
- b. Yes, in most areas
- c. Yes, in a few most significant areas
- d. No

Comments:

FORM 1: BASIC CHARACTERISTICS OF COMPUTER BASED
EMISSION INVENTORY SYSTEM

STATE _____

SYSTEM NAME _____

DEVELOPED BY _____

IS THE DATA KEPT ON?	TAPE	
	CARDS	
	DISK/DRUM	
	OTHER (SPECIFY)	

IS THE SYSTEM NEDS COMPATIBLE FOR _____?	INPUT	
	OUTPUT	
	UNITS OF MEASURE	
	FIELD SIZES	
	DATA ELEMENTS	

DOES SYSTEM HAVE BASIC CAPABILITY FOR _____?	FILE MAINTENANCE	
	DATA EDIT	
	DATA VALIDATION	
	EMISSION CALCULATIONS	
	LOGICAL RETRIEVAL	

DOES SYSTEM HAVE GENERATION CAPA- BILITY FOR _____?	FORMATTED FILE DUMP	
	MULTIPLE REPORT FORMS	
	SUMMARY REPORTS	
	VARIABLE FORMS	

IS THE SYSTEM LANGUAGE _____?	ANSI COBOL	
	ANSI FORTRAN	
	OTHER (SPECIFY)	

FORM 2: BASIC CHARACTERISTICS OF COMPUTER BASED
AIR QUALITY DATA FILE SYSTEM

STATE _____
SYSTEM NAME _____
DEVELOPED BY _____

IS THE DATA KEPT ON?	CARDS
	TAPE
	DISK/DRUM
	OTHER (SPECIFY)

IS THE SYSTEM SAROAD COMPATIBLE FOR _____?	INPUT
	OUTPUT
	UNITS OF MEASURE
	FIELD SIZES
	DATA ELEMENTS

DOES THE SYSTEM HAVE A BASIC CAPABILITY FOR _____?	FILE MAINTENANCE
	DATA EDIT
	DATA VALIDATION
	STATISTICAL PROCESSING
	LOGICAL RETRIEVAL

DOES THE SYSTEM HAVE REPORT GENERATION CAPA- BILITY _____?	FILE MAINTENANCE
	MULTIPLE REPORT FORMS
	SUMMARY REPORTS
	STATISTICAL REPORTS

IS THE SYSTEM LANGUAGE _____?	ANSI COBOL
	ANSI FORTRAN
	OTHER (SPECIFY)

APPENDIX B

SURVEY COMPILATIONS

Appendix B
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3	Agency Use of NEDS and SAROAD Facilities	2
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Appendix B
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B-4	Summary of Staff Increases due to Semi Annual Reports	17
B-5	List of Computer Based Air Quality Systems Currently in Use	

Chart Number 1 Agency Knowledge of NEDS, CDHS and SAROAD													
Questionnaire Cross Reference 1a - 1d													
Has the Agency received documentation or briefing on support facilities for emission inventories and air quality data as provided by EPA													
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	APTD 1135		CDHS (EIS)		CDHS (AQDHS)		SAROAD				
			YES	NO	YES	NO	YES	NO	YES	NO			
I	6	6	6	0	3	3	6	0	6	0			
II	4	4	4	0	4	0	4	0	4	0			
III	6	0	-	-	-	-	-	-	-	-			
IV	8	1	1	0	0	1	1	0	1	0			
V	6	6	6	0	1	5	3	3	6	0			
VI	5	5	5	0	5	0	5	0	5	0			
VII	4	4	4	0	2	2	4	0	4	0			
VIII	6	0	-	-	-	-	-	-	-	-			
IX	6	4	4	0	1	3	4	0	4	0			
X	4	0	-	-	-	-	-	-	-	-			
Total	55	30	30	0	16	14	27	3	30	0			

Chart Number 2 Use of Special Reporting Formats															
Questionnaire Cross Reference		1e													
Has the agency received approval to submit data to regional offices on locally devised forms?															
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	YES	NO											
I	6	6	0	6											
II	4	4	0	4											
III	6	0	-	-											
IV	8	1	0	1											
V	6	3	1	2											
VI	5	5	5	0											
VII	4	4	2	2											
VIII	6	0	-	-											
IX	6	4	0	4											
X	4	0	-	-											
Total	55	27	8	19											

Chart Number 3 Agency Use of NEDS and SAROAD Facilities															
Questionnaire Cross Reference 1															
Has the agency made use of the NEDS and SAROAD systems?															
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	REQUESTED NEDS SUPPORT		REQUESTED SAROAD SUPPORT		AGENCY AWARENESS OF AVAILABLE EPA SUPPORT								
			NEDS						SAROAD						
			YES	NO	YES	NO	YES	NO	YES	NO	NO RESP.				
I	6	6	3	3	4	2				2	4	0	4	2	0
II	4	4	4	0	4	0				4	0	0	4	0	0
III	6	0	-	-	-	-				-	-	-	-	-	-
IV	8	1	1	0	0	1				1	0	0	1	0	0
V	6	6	3	3	5	1				3	2	1	6	0	0
VI	5	5	3	2	5	0				1	4	0	0	5	0
VII	4	4	3	1	4	0				0	4	0	0	3	1
VIII	6	0	-	-	-	-				-	-	-	-	-	-
IX	6	4	3	1	3	1				2	1	1	3	1	0
X	4	0	-	-	-	-				-	-	-	-	-	-
Total	55	30	20	10	25	5				13	15	2	18	11	1

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Chart Number 4 Availability of Computer Facilities																
Questionnaire Cross Reference Question 3																
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	PROGRAMMING LANGUAGES						CURRENT USAGE				FACILITY CONTROL			
			NO COMP. AVAIL	COMP. AVAIL	CORE ≥100K	ANSI COBOL	ANSI FORT.	BOTH	EI	AO	BOTH	AGCY.	STATE	RENT	EPA	
I	6	4	0	4	4	4	3	3	3	1	2	1	0	2	1	0
II	4	4	1	3	3	3	3	3	3	1	2	0	0	3	0	0
III	6	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IV	8	1	0	1	1	1	1	1	1	0	1	0	0	-	1	0
V	6	6	0	6	5	3	4	2	2	3	4	2	2	4	0	0
VI	5	4	1	3	1	3	3	3	3	2	3	2	0	3	0	1
VII	4	2	1	1	0	1	1	1	1	2	0	0	0	2	0	0
VIII	6	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IX	6	4	2	2	1	1	1	1	1	0	1	0	0	2	0	0
X	4															
Total	55	25	5	20	15	16	16	14	14	9	13	5	2	16	2	1

Chart Number	5	Types of Emission Inventories at State Agencies
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Questionnaire Cross Reference	Question 4
-------------------------------	------------

REGION	AGENCIES IN REGION	RESPONSES RECEIVED	COMPUTER BASED										
			Man-ual	Punch Card	Avail	Not Avail							
I	6	6	5	0	1	0							
II	4	4	3	0	1	0							
III	6	0	-	-	-	-							
IV	8	1	1	0	0	0							
V	6	6	3	0	2	1							
VI	5	5	3	0	0	2							
VII	4	4	2	0	0	2							
VIII	6	0	-	-	-	-							
IX	6	4	4	0	0	0							
X	4	0	-	-	-	-							
Total	55	30	21	0	4	5							

Chart Number 6 Capabilities of Computer Based EI Systems at State Agencies																
Questionnaire Cross Reference 5, 6, 20																
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	OUTPUT COMPAT-IBLE		EDITING				FUNCTIONAL SUPPORT		COMPATIBILITY WITH NEDS SPECIFICATIONS					
			YES	NO	MAN	COMP-UTER	BOTH	AUDIT	ALL	IDENT	SCC	UNITS	SRC DEF	DATA TYPES		
I	6	1	1	0	0	0	1	1	1	1	1	1	1	1	1	1
II	4	1	0	1	0	1	0	1	1	1	1				1	1
III	6	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IV	8	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
V	6	2	0	1	1	1	0	-	1	1	1	1	2	2	1	1
VI	5	2	1	1	2	0	0	2	1	2	2	2	2	2	2	2
VII	4	2	2	0	0	0	2	2	1	2	2	2	2	2	2	2
VIII	6	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IX	6	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	55	8	4	3	3	2	3	6	5	6	7	6	7	7	7	7

Chart Number 7 Storage Characteristics of Manual FI Systems															
Questionnaire Cross Reference Question 7															
NO RESP. = No response			ORIG = Emission inventory consists of originals of source forms												
SEP = Emissions inventory files are separate from all others			LOCAL = Emission inventory is kept on special local forms												
MIXED = Emission inventory files are merged with other data			NEDS = Emission inventory is kept on NEDS forms or NEDS listing												
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	TYPE OF STORAGE			APPROXIMATE VOLUME (No. of File Drawers)						STORAGE MEDIA			
			NO RESP	SEP	MIXED	0-1	2-5	6-12	>12	NO RESP	ORIG	LOCAL	NEDS		
I	6	5	2	3	0	1	1	1	0	2	3	0	0		
II	4	3	0	1	2	2	0	0	1	0	1	2	0		
III	6	0	-	-	-	-	-	-	-	-	-	-	-		
IV	8	1	0	1	0	0	0	1	0	0	0	0	1		
V	6	3	1	2	0	0	0	0	0	3	1	1	1		
VI	5	3	0	3	0	0	1	1	1	0	2	0	1		
VII	4	2	0	0	2	0	1	0	1	0	2	0	0		
VIII	6	0	-	-	-	-	-	-	-	-	-	-	-		
IX	6	4	0	4	0	2	0	0	0	2	1	1	2		
X	4	0	-	-	-	-	-	-	-	-	-	-	-		
Total	55	21	3	14	4	5	3	3	3	7	10	4	5		

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Chart Number 8 Sources of Data for Emission Inventories														
Questionnaire Cross Reference 8														
MAN: Manual System														
C-B: Computer Based System														
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	PERMIT AND REGISTRATION APPLICATIONS			INSPECTION REPORTS			QUESTIONNAIRES			MORE THAN ONE SOURCE		
			MAN	C-B	TOT	MAN	C-B	TOT	MAN	C-B	TOT	MAN	C-R	TOT
I	6	6	1	1	2	0	0	0	1	0	1	3	0	3
II	4	4	1	1	2	0	0	0	1	0	1	1	0	1
III	6	0	-	-	-	-	-	-	-	-	-	-	-	-
IV	8	1	1	0	1	0	0	0	0	0	0	1	0	1
V	6	5	2	0	2	0	1	1	0	1	1	0	1	1
VI	5	5	2	1	3	0	0	0	0	0	0	1	1	2
VII	4	4	0	0	0	0	0	0	0	2	2	2	0	2
VIII	6	0	-	-	-	-	-	-	-	-	-	-	-	-
IX	6	4	0	0	0	0	0	0	0	0	0	4	0	4
X	4	0	-	-	-	-	-	-	-	-	-	-	-	-
Total	55	29	7	3	10	0	1	1	2	3	5	12	2	14

Chart Number 9 Type of Emission Inventories														
Questionnaire Cross Reference Question 9														
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	AS REPORTED BY ALL AGENCIES					COMPUTER-BASED SYSTEMS REPORTING	AS REPORTED BY AGENCIES WITH COMPUTER BASED EMISSION INVENTORIES					
			0 - 500	500 - 1000	1000 - 5000	10000 - 20000	>100000		0 - 500	500 - 1000	1000 - 5000	10000 - 20000	>100000	
I	6	6	2	3	1	0	0	1	0	0	1	0	0	
II	4	4	2	0	0	0	2	1	0	0	0	0	1	
III	6	0	-	-	-	-	-	0	-	-	-	-	-	
IV	8	1	0	0	1	0	0	0	-	-	-	-	-	
V	6	4	1	0	0	3	0	3	0	0	0	3	0	
VI	5	1	0	0	1	0	0	0	-	-	-	-	-	
VII	4	4	2	0	2	0	0	2	1	0	1	0	0	
VIII	6	0	-	-	-	-	-	0	-	-	-	-	-	
IX	6	4	3	0	1	0	0	0	-	-	-	-	-	
X	4	0	-	-	-	-	-	-	-	-	-	-	-	
Total	55	24	10	3	6	3	2	7	1	0	2	3	1	

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Chart Number 10 Reported EI Size Compared to NEDS Data Base														
Questionnaire Cross Reference Question 9, NEDS Report dated November 6, 1973														
MAN: Manual Systems														
C-B: Computer Based Systems														
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	Range of Excess Sources											
			0 - 200			200 - 500			1000 - 5000			5000		
			MAN	C-B	TOT	MAN	C-B	TOT	MAN	C-B	TOT			
I	6	6	3	0	3	2	0	2	0	1	1	0	0	0
II	4	3	2	0	2	0	0	0	0	0	0	1	0	1
III	6	0	-	-	-	-	-	-	-	-	-	-	-	-
IV	8	1	0	0	0	0	0	0	1	0	1	0	0	0
V	6	4	0	1	1	0	0	0	0	0	0	1	2	3
VI	5	1	1	0	1	0	0	0	0	0	0	0	0	0
VII	4	3	1	1	2	0	0	0	1	0	1	0	0	0
VIII	6	0	-	-	-	-	-	-	-	-	-	-	-	-
IX	6	4	3	-	3	0	0	0	1	0	1	0	0	0
X	4	0	-	-	-	-	-	-	-	-	-	-	-	-
Total	55	22	10	2	12	2	0	2	3	1	4	2	2	4

Chart Number 11 Emmission Invenotry Maintenance Practices (Manual Systems)

Questionaire Cross Reference Questions 12, 13

NUM. RESP. = Number of agencies responding.
 REPL = Update by replacing entire system.
 CORR = Update by correcting form in file.

REGION	AGENCIES IN REGION	RESPONSES RECEIVED	METHOD FOR UPDATING FILE			UPDATING FREQUENCY				AUDIT TRAIL	
			NUM. RESP.	REPL	CORR	NUM. RESP.	12 MOS.	6 MOS.	AS RCUD	NUM. RESP.	AUDIT KEPT
I	6	5	4	4	0	4	2	2	0	2	2
II	4	3	2	2	0	2	2	0	0	0	-
III	6	0	0	-	-	0	-	-	-	0	0
IV	8	1	1	1	0	1	0	0	1	0	-
V	6	3	2	2	0	1	0	0	1	0	-
VI	5	3	2	2	0	3	0	3	0	0	-
VII	4	2	2	1	1	2	0	2	0	0	-
VIII	6	0	0	-	-	0	-	-	-	0	-
IX	6	4	3	2	1	4	0	0	4	1	1
X	4	0	0	-	-	-	-	-	-	-	-
Total	55	21	16	14	2	17	4	7	6	3	3

Chart Number 12 Emission Inventory Maintenance Practice (Computer Based Systems)

Questionnaire Cross Reference Questions 12, 13

NUM. RESP. = Number of Agencies Responding

REPL. = Card Image Replacement

FIELD = Data Field

REGION	AGENCIES IN REGION	RESPONSES RECEIVED	METHOD TO UPDATE FILE		NUM. RESP.	12 MOS.	6 MOS.	1 WEEK	AS RCVD	AUDIT TRAIL			
			REPL.	FIELD						NUM. RESP.	ADD	DEL	CHG.
I	6	1	1	0	1	1	0	0	0	1	1	1	1
II	4	1	0	1	1			1		1	1	1	1
III	6	0	-	-	0	-	-	-	-	0	-	-	-
IV	8	0	-	-	0	-	-	-	-	0	-	-	-
V	6	3	1	2	3	2	0	1	0	0	-	-	-
VI	5	2	2	0	2	1	0	0	1	2	2	2	2
VII	4	2	2	0	2	0	2	0	0	2	2	2	2
VIII	6	0	-	-	0	-	-	-	-	0	-	-	-
IX	6	0	-	-	0	-	-	-	-	0	-	-	-
X	4	0	-	-	-	-	-	-	-	0	-	-	-
Total	55	9	6	3	9	4	2	2	1	6	6	6	6

Chart Number 13 Storage Concept and Confidential Data Factors (manual Systems)

Questionnaire Cross Reference Questions 14, 15

NUM. RESP. = number of agencies responding HISTORY = Emission inventory data that is changed is put in a historical file

INDEF. = emission inventory data is kept indefinitely

DISCARD = emission inventory is kept until changed, replaced data is discarded

REGION	AGENCIES IN REGION	RESPONSES RECEIVED	RETENTION OF DATA					PERCENT OF SOURCES THAT CONTAIN CONFIDENTIAL DATA				SYSTEM TO PROTECT CONFIDENTIAL DATA		
			NUM. RESP.	IN-DEF	DIS-CARD	HIST-ORY	NUM. RESP.	NONE	1-2 0/0	4-6 0/0	6 0/0	NUM. RESP.	YES	NO
I	6		5	2	0	2	3	3				0	-	-
II	4		2	1	1	0	2	1		1		0	-	-
III	6		0	-	-	-	0	-	-	-	-	0	-	-
IV	8		1	1	0	0	0	-	-	-	-	0	-	-
V	6		2	1	0	1	0	-	-	-	-	2	1	1
VI	5		3	1	0	2	0	-	-	-	-	3	2	1
VII	4		2	1	0	1	2	-	-	1	1	1	1	0
VIII	6		0	-	-	-	0	-	-	-	-	0	-	-
IX	6		4	2	1	1	0	-	-	-	-	3	1	2
X	4		0	-	-	-	0	-	-	-	-	-	-	-
Total	55		18	9	2	7	7	4	0	2	1	9	5	4

Chart Number 14 Storage Concepts and Confidential Data Factors (Computer Based Systems)
Questionnaire Cross Reference Questions 14, 15

NUM. RESP. = number of agencies responding HISTORY = emission inventory data that is changed
INDEF = emission inventory data that is is put in historical file
kept indefinitely
DISCARD = emission inventory data is dis-
carded as new data becomes available.

REGION	AGENCIES IN REGION	RESPONSES RECEIVED	RETENTION OF DATA				PERCENT OF SOURCES THAT CONTAIN CONFIDENTIAL DATA					AVAILABLE SYSTEM TO PROTECT CONFIDENTIAL DATA		
			NUM. RESP.	IN-DEF	DIS-CARD	HIST-ORY	NUM. RESP.	NONE	0-1 O/O	2-4 O/O	4-6 O/O	NUM. RESP.	YES	NO
I	6	1	1	0	0	1	1	1	0	0	0	1	1	0
II	4	1	1	0	1	0	1	1	0	0	1	0	-	-
III	6	0	0	-	-	-	0	-	-	-	-	0	-	-
IV	8	0	0	-	-	-	0	-	-	-	-	0	-	-
V	6	3	3	1	-	2	3	2	0	1	0	3	1	2
VI	5	2	2	1	1	0	2	2	0	0	0	2	0	2
VII	4	2	2	1	0	1	2	-	1	-	1	2	1	1
VIII	6	0	-	-	-	-	0	-	-	-	-	0	-	-
IX	6	0	-	-	-	-	0	-	-	-	-	0	-	-
X	4	0	-	-	-	-	0	-	-	-	-	0	-	-
Total	55	9	9	3	2	4	9	5	1	1	2	8	3	5

Chart Number: 15 Manpower Requirements (Manual Systems)

Questionnaire Cross Reference Questions 16, 17, 19

NUM. RESP: Number of Responses

REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANPOWER (man-years)						FEDERAL REPORTING CAUSES INPUT			AGENCY HAS RE-PORTED IN NEDS FORMAT		
			NUM. RESP.	0-1	1-2	2-3	4-5	5	NUM. RESP.	YES	NO	NUM. RESP.	YES	NO
I	6	5	4	2	1	1	0	0	3	0	3	3	1	2
II	4	3	3	1	1	0	0	1	3	0	3	3	1	2
III	6	0	-	-	-	-	-	-	0	-	-	0	-	-
IV	8	1	0	-	-	-	-	-	0	-	-	1	1	0
V	6	3	2	1	0	0	1	0	2	1	1	3	1	2
VI	5	3	3	0	0	2	0	1	3	0	3	3	0	3
VII	4	2	2	1	0	0	0	1	2	1	1	2	1	1
VIII	6	0	-	-	-	-	-	-	0	-	-	0	-	-
IX	6	4	3	1	0	0	2	0	3	1	2	4	1	3
X	4	0	-	-	-	-	-	-	0	-	-	0	-	-
Total	55	21	17	6	2	3	3	3	16	3	13	19	6	13

Chart Number		15 (Continued)	Manpower Requirements (Manual Systems)																	
Questionnaire Cross Reference		Questions 16, 17, 19																		
CONTR: Emission Inventory compiled and submitted by contractor																				
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	REASONS FOR NON-SUBMITTAL						CONTR	NOT NEEDED.	NO SYS	OTHER								
I	6	2	0	0	0	2														
II	4	2	0	1	1															
III	6	0	-	-	-	-														
IV	8	0	-	-	-	-														
V	6	0	-	-	-	-														
VI	5	3	3	0	0	0														
VII	4	1	1	0	0	0														
VIII	6	0	-	-	-	-														
IX	6	2	2	-	-	-														
X	4	0	-	-	-	-														
Total	55	10	6	1	1	2														

Chart Number		16 Manpower Requirements (Computer Based System)														
Questionnaire Cross Reference												Questions 16, 17, 19				
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANPOWER (man-years)						FEDERAL RE-PORTING LOSSES IMPACT			AGENCY HAS RE-PORTED IN NEDS FORMAT			REASON FOR NON-SUB-MITTAL	
			NUM. RESP.	0-1	1-2	2-3	5	NUM. RESP.	YES	NO	NUM. RESP.	YES	NO	CONTR	NO	
I	6	1	1	1	0	0	0	1	1	1	0	1	1	0		
II	4	1	1	0	0	1	0	1	1	0	1	1	0	1		1
III	6	0	0	-	-	-	-	0	-	-	-	0	-	-		
IV	8	0	0	-	-	-	-	0	-	-	-	0	-	-		
V	6	3	3	1	0	0	2	1	0	1	1	3	2	1	1	
VI	5	2	2	1	0	0	1	2	0	2	1	2	1	1		
VII	4	2	2	1	1	0	0	2	0	2	2	2	2	0		
VIII	6	0	0	-	-	-	-	0	-	-	-	0	-	-		
IX	6	0	0	-	-	-	-	0	-	-	-	0	-	-		
X	4	0	0	-	-	-	-	0	-	-	-	0	-	-		
Total	55	9	9	4	1	1	3	7	1	6	9	6	3			

Chart Number 17 Methods Used to Submit Semi-Annual Reports												
Questionnaire Cross Reference Question 18												
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL SYSTEMS				COMPUTER BASED SYSTEMS					
			NUM. RESP.	NEDS LIST	LOCAL LIST	NEDS FORMS	NUM. RESP.	NEDS LIST	PUNCH CARD	TAPE OR TAPE	LIST CARD OR TAPE	NEDS FORMS
I	6	5	4	1	1	2	1	0	0	0	1	0
II	4	4	3	0	2	1	1	0	0	1	0	0
III	6	0	0	-	-	-	0	-	-	-	-	-
IV	8	1	1	0	0	1	0	-	-	-	-	-
V	6	6	3	0	1	2	3	2	0	0	0	1
VI	5	5	3	2	0	1	2	1	0	0	0	1
VII	4	4	2	0	0	2	2	0	0	2	0	0
VIII	6	0	0	-	-	-	0	-	-	-	-	-
IX	6	1	1	0	0	1	0	-	-	-	-	-
X	4	0	0	-	-	-	0	-	-	-	-	-
Total	55	24	17	3	4	10	9	3	0	3	1	2

Chart Number 18 Compatibility of Agency Systems with NEDS

Questionnaire Cross Reference Question 20

REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL SYSTEM						COMPUTER BASED SYSTEMS						
			NO ELEM	SRC INDENT	SCC	UNITS	DATA TYPES	SRC DEF	NUM. RESP.	NO ELEM	SRC INDENT	SCC	UNITS	DATA TYPES	SRC DEF
I	6	4		4	3	3	3	2	1		1	1	1	1	1
II	4								1		1	0	0	1	1
III	6	0	-	-	-	-	-	-	0	-	-	-	-	-	-
IV	8	1	1	0	0	0	0	0	0	0	0	0	0	0	0
V	6	3		3	3	3	3	3	3	1	1	1	2	2	1
VI	5	3		3	3	3	3	3	2		2	2	2	2	2
VII	4	2	2	0	0	0	0	0	2	0	1	2	3	3	3
VIII	6	0	-	-	-	-	-	-	0	-	-	-	-	-	-
IX	6	4	1	2	2	3	1	3	0	-	-	-	-	-	-
X	4	0	-	-	-	-	-	-	0	-	-	-	-	-	-
Total	55	17	4	12	11	12	10	11	9	1	6	6	6	8	7

Chart Number 19 Agency Satisfaction with Current Emission Inventory System												
Questionnaire Cross Reference Question 21												
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL SYSTEMS				COMPUTER BASED SYSTEMS					
			SATIS- FIED	MOST	SOME	NOT SATIS.	NUM. RESP.	SATIS MOST	SOME	NOT SATIS.		
I	6	5	1	0	2	2	1	0	1	0		
II	4	2	1	0	0	1	1	1	0	0		
III	6	0	-	-	-	-	0	-	-	-		
IV	8	1	0	0	0	1	0	-	-	-		
V	6	3	0	0	0	3	3	0	1	0		
VI	5	3	0	0	3		2	0	1	1		
VII	4	2	1	1	0	0	2	2	0	0		
VIII	6	0	-	-	-	-	0	-	-	-		
IX	6	4	0	0	1	3	0	-	-	-		
X	4	0	-	-	-	-	0	-	-	-		
Total	55	20	3	1	6	10	9	3	3	1	2	

CHART 20
SUMMARY OF FORM 1 RESPONSES

TOTAL SYSTEMS - 6

IS THE DATA KEPT ON?	TAPE	1
	CARDS	
	DISK/DRUM	3
	TAPE AND DISK	2

IS THE SYSTEM NEDS COMPATIBLE FOR _____?	INPUT	1
	OUTPUT	2
	UNITS OF MEASURE	2
	FIELD SIZES	1
	DATA ELEMENTS	3

DOES SYSTEM HAVE BASIC CAPABILITY FOR _____?	FILE MAINTENANCE	6
	DATA EDIT	6
	DATA VALIDATION	5
	EMISSION CALCULATIONS	3
	LOGICAL RETRIEVAL	4

DOES SYSTEM HAVE GENERATION CAPA- BILITY FOR _____?	FORMATTED FILE DUMP	4
	MULTIPLE REPORT FORMS	3
	SUMMARY REPORTS	5
	VARIABLE FORMS	3

IS THE SYSTEM LANGUAGE _____?	ANSI COBOL	2
	ANSI FORTRAN	2
	BOTH	2

Chart Number 21 Tapes of Air Quality Data Systems											
Questionnaire Cross Reference Question 22											
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	COMPUTER BASED								
			MAN	P.C.	AVAIL	NOT AVAIL	NONE				
I	6	6	4	1	1	0					
II	4	4	1		2		1				
III	6	0	-	-	-	-					
IV	8	1	0	0	1	0					
V	6	6	2		1	3					
VI	5	5	1	1	0	3					
VII	4	4	2	2	0	0					
VIII	6	0	-	-	-	-					
IX	6	4	3		1	0					
X	4	0	-	-	-	-					
Total	55	29	13	3	6	6					

Chart Number: 22 Air Quality Data Editing											
Questionnaire Cross Reference Question 23											
M - manual system CB - computer based system PC - punched card systems											
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL EDITING			COMPUTER BASED EDITING			BOTH		
			M	CB	PC	M	CB	PC	M	CB	PC
I	6	6	4	0	1	0	0	0	0	1	0
II	4	3	1	1	0	0	0	0	0	1	0
III	6	0	-	-	-	-	-	-	-	-	-
IV	8	1	0	0	0	0	0	0	0	1	-
V	6	5	2	0	0	0	1	0	0	2	-
VI	5	5	1	0	1	0	3	0	0	0	-
VII	4	4	2	0	1	0	0	1	0	0	-
VIII	6	0	-	-	-	-	-	-	-	-	-
IX	6	3	2	0	0	0	0	0	0	1	-
X	4	0	-	-	-	-	-	-	-	-	-
Total	55	27	12	1	3	0	5	1	0	6	0

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Chart Number 23 Storage Concept - Manual Air Quality System														
Questionnaire Cross Reference Question 24														
SEP STR - Air quality stored in separate file														
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	FORM OF STORAGE			STORAGE VOLUME (file drawers)								
			SEP STR	ORIG	SAR-OAD	0-2	3-6	6-10						
I	6	4	4	2	2	3	1	0						
II	4	1	1	0	1	1	0	0						
III	6	0	-	-	-	-	-	-						
IV	8	0	-	-	-	-	-	-						
V	6	2	2	0	2	-	-	-						
VI	5	1	1	0	1	0	0	1						
VII	4	2	2	1	1	2	0	0						
VIII	6	0	-	-	-	-	-	-						
IX	6	3	3	0	3	2	0	0						
X	4	0	0	-	-	-	-	-						
Total	55	13	13	3	10	8	1	1						

Chart Number 24 Source Forms for Air Quality Data

Questionnaire Cross Reference Question 25

REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL SYSTEMS			COMPUTER BASED SYSTEMS			PUNCHED CARD SYSTEMS		
			NUM. RESP.	SAR-OAD	LOCAL	NUM. RESP.	SAR-OAD	LOCAL	NUM. RESP.	SAR-OAD	LOCAL
I	6		4	2	2	1	1	0	1	1	0
II	4		1	1	0	2	0	2	0	-	-
III	6		0	-	-	0	-	-	0	-	-
IV	8		0	-	-	1	1	0	0	-	-
V	6		2	2	0	4	1	3	0	-	-
VI	5		1	1	0	3	3	0	1	1	0
VII	4		2	1	1	0	-	-	2	2	0
VIII	6		0	-	-	0	-	-	0	-	-
IX	6		3	3	0	1	0	1	0	-	-
X	4		0	-	-				0	-	-
Total	55		13	10	3	12	6	6	4	4	0

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Chart Number 25 File Maintenance Concepts - Air Quality System																
Questionnaire Cross Reference Question 27																
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	INTERVAL BETWEEN UPDATES													
			MANUAL SYSTEMS				COMPUTER SYSTEMS									
			NUM. RESP.	AS REVD. MO.	1 MO.	3 MOS.	NUM. RESP.	AS REVD. WK	1 WK	1 MO						
I	6		4	3	1	0		1	0	0	1					
II	4		1	1	0	0		2	2	0						
III	6		0	-	-	-		0	-	-	-					
IV	8		0	-	-	-		1	0	1	0					
V	6		1	0	0	1		4	0	0	4					
VI	5		1	1	0	0		3	0	2	1					
VII	4		2	0	1	1		0	-	-	-					
VIII	6		0	-	-	-		0	-	-	-					
IX	6		2	1	1	0		1	0		1					
X	4		0	-	-	-		0	-	-	-					
Total	55		11	6	3	2		12	2	3	7					

Chart Number 26 Storage Concepts for Air Quality Data															
Questionnaire Cross Reference Question 28															
ACT 1-2 yrs: A.Q. data stored in active file for 1-2 years, then transferred to inactive or history file															
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	IN-DEF	ACT 1-2 yrs											
I	6	5	5	1											
II	4	4	4	1											
III	6	0	-	-											
IV	8	1	1	1											
V	6	6	6	3											
VI	5	5	5	1											
VII	4	4	4	0											
VIII	6	0	-	-											
IX	6	3	3	0											
X	4	0													
Total	55	28	28	6											

Chart Number 27 Submission of SAROAD Data												
Questionnaire Cross Reference Question 29												
The number of states in each region that have submitted SAROAD data as measured by the NEDS report system are entered in the column labeled "NEDS" and were extracted from the NEDS report "States Generally in Compliance with SIP Reporting Regulation" dated September 10, 1973.												
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL		COMPUTER BASED		PUNCH CARD				NEDS	
			YES	NO	YES	NO	YES	NO	YES	NO		
I	6	5	4	0		1	0		0	0		3
II	4	4	1	0		2	0		1	0		2
III	6	0	-	-		-	-		-	-		(5)
IV	8	1	0	0		1	0		0	0		7
V	6	6	2	0		3	1		0	0		4
VI	5	5	1	0		3	0		1	0		4
VII	4	4	2	0		0	0		2	0		4
VIII	6	0	-	-		-	-		-	-		(4)
IX	6	4	3	0		1	0		0	0		3
X	4	0	-	-		-	-		-	-		(4)
Total	55	29	13	0		11	1		4	0		40

Chart Number 28 SAROAD Compatibility											
Questionnaire Cross Reference Question 30											
COM - Compatible with SAROAD specifications for data submittal											
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL		COMPUTER BASED				PUNCH CARD		
			COM	NOT COM		COM	NOT COM		COM	NOT COM	
I	6	5	4	0		1	0		1	0	
II	4	3	1	0		2	0				
III	6	0	-	-		-	-				
IV	8	1	-	-		1	0				
V	6	6	2	0		4	0				
VI	5	4	1	0		3	0		1	0	
VII	4	2	1	1		-	-		1	1	
VIII	6	0	-	-		-	-				
IX	6	4	3	0		0	1				
X	4	0	-	-		-	-				
Total	55	25	12	1		11	1		3	1	

Chart Number 29 Method of Submitting AQ Data											
Questionnaire Cross Reference Question 31											
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL SYSTEMS			COMPUTER BASED SYSTEMS				PUNCHED-CARD SYSTEMS	
			SAROAD	CARDS		SAROAD	FORMS	CARDS	TAPE	OTHER	SAROAD
I	6		4	0		0	0	0	0	1	0
II	4		1	0		0	0	0	2	0	
III	6		-	-		-	-	-	-	-	
IV	8		-	-		-	-	-	-	-	
V	6		1	1		0	0	0	3	1	
VI	5		1	0		0	1	1	2	0	0
VII	4		0	2		-	-	-	-	-	2
VIII	6		-	-		-	-	-	-	-	
IX	6		3	0		0	0	0	0	1	
X	4		-	-		-	-	-	-	-	
Total	55		10	3		0	1	1	8	3	2

Chart Number 30 Staffing Levels for AQ Systems														
Questionnaire Cross Reference Question 32														
STAFFING LEVEL IN MAN YEARS														
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL SYSTEMS					COMPUTER BASED SYSTEMS						
			0-1	1-3	3-5	5-10	10	0-1	1-3	3-5	5-10	10		
I	6		1	2	0	1	0		0	1	0	0		
II	4		1	0	0	0	0		0	1	0	0	1	
III	6		-	-	-	-	-		-	-	-	-	-	
IV	8		-	-	-	-	-		0	1	0	0	0	
V	6		-	-	-	-	-		0	3	0	0	0	
VI	5		0	1	0	0	0		0	2	0	0	0	
VII	4		2	0	0	0	0		-	-	-	-	-	
VIII	6		-	-	-	-	-		-	-	-	-	-	
IX	6		3	0	0	0	0		0	0	1	0	0	
X	4		-	-	-	-	-		-	-	-	-	-	
Total	55		7	3	0	1	0		0	8	1	0	1	

Y017
170100

Chart Number 31 Agency Satisfaction with Existing A0 System														
Questionnaire Cross Reference Question 33														
SAT - Agency generally satisfied with existing system														
MOST - Agency satisfied with most aspects of existing system														
SOME - Agency satisfied with a few aspects of existing system														
NOT SAT - Agency generally dissatisfied with existing system														
REGION	AGENCIES IN REGION	RESPONSES RECEIVED	MANUAL SYSTEM				COMPUTER SYSTEMS				PUNCH CARD			
			SAT	MOST	SOME	NOT SAT	SAT	MOST	SOME	NOT SAT	SAT	MOST	SOME	NOT SAT
I	6	5	0	1	0	3	1	0	0	0	-	-	-	-
II	4	3	1	0	0	0	2	0	0	0			0	1
III	6	0	-	-	-	-	-	-	-	-			-	-
IV	8	1	-	-	-	-	1	0	0	0				
V	6	5	0	0	0	2	2	0	1	0				
VI	5	4	0	0	0	1	1	0	2	0				1
VII	4	2	1	1	0	0	-	-	-	-	2			
VIII	6	0	-	-	-	-	-	-	-	-				
IX	6	3	1	0	0	1	0	0	1	0				
X	4	0	-	-	-	-	-	-	-	-				
Total	55	23	3	2	0	7	7	0	4	0	2	0	0	2

CHART 32
AIR QUALITY DATA FILE SYSTEM
SUMMARY

TOTAL SYSTEM - 13

IS THE DATA KEPT ON?	CARDS	5
	TAPE	3
	DISK/DRUM	5

IS THE SYSTEM SAROAD COMPATIBLE FOR _____ \$	INPUT	9
	OUTPUT	11
	UNITS OF MEASURE	11
	FIELD SIZES	10
	DATA ELEMENTS	10

DOES THE SYSTEM HAVE A BASIC CAPA- BILITY FOR _____ ?	FILE MAINTENANCE	12
	DATA EDIT	13
	DATA VALIDATION	11
	STATISTICAL PROCESSING	11
	LOGICAL RETRIEVAL	12

DOES THE SYSTEM HAVE A REPORT GENERATION CAPA BILITY _____ ?	FORMATTED FILE DUMP	9
	MULTIPLE REPORT FORMS	10
	SUMMARY REPORTS	12
	STATISTICAL REPORTS	9

IS THE SYSTEM LANGUAGE _____ ?	ANSI COBOL	5
	ANSI FORTRAN	3
	BOTH	5

REGION	STATE	MAKE	MODEL	CORE	NO. OF TAPES	COMPILER (1)	USAGE (2)	ADEQUATE TIME	
								E	A
I	Connecticut	IBM	370/155	250K	18	C, F	EI, AQ	Y	Y
	Rhode Island	IBM	360/40	110K	4	C		Y	Y
	Maine	Honeywell	6000	256K	12	C, F		Y	Y
	Massachusetts	IBM	370/155	1.5M	5	C, F	AQ	Y	Y
	New Hampshire	not reported							
II	Vermont	not reported						NR	NR
	Puerto Rico	IBM	370/155	700K	6	C, F		Y	NR
	New York	IBM	370/155	500K	NR	C, F	EI	Y	NR
		Burroughs	3500	150K	4	(3)	AQ	NR	Y
	New Jersey	IBM	370/145	750K	NR	C, F	AQ	Y	Y
IV	Virgin Islands	no computer available							
	Florida	Univac	70	130K	6	C, F	AQ	Y	Y
V	Illinois	IBM	370/165	NR	20	C	EI, AQ	Y	Y
	Michigan	IBM	370/155	75K	12	C, F	EI	Y	Y
		CDC	6500	96K	4	C, F	AQ	Y	Y
	Wisconsin	Univac	9400	64K	2	F	EI, AQ	Y	Y
	Minnesota	CDC	3300	230K	4	F	AQ	NR	Y
VI	Ohio	IBM	370/155	2M	20	C, F		Y	Y
	Indiana	IBM	370/165	7500K	NR	NR		Y	Y
	Arkansas	not reported						N	Y
	Texas	Univac	1106	262K	6	C, F	EI, AQ	Y	Y
	Oklahoma	IBM	370/145	NR	NR	C, F		Y	Y
VII	Louisiana	no computer available						N	N
	New Mexico	IBM	360	NR	3	C, F	EI, AQ	N	Y
	Missouri	no computer available						N	N
	Nebraska	not reported					EI	Y	NR
	Iowa	IBM	370	86K	4	C, F	EI	Y	Y
IX	Kansas	not reported						NR	NR
	California	CDC	3300	96K	6	C, F	AQ	NR	Y
	Nevada	IBM	360	NR	NR	NR		Y	Y
	Hawaii	no computer available						N	N
	Guam	no computer available						N	N

- (1) C indicates ANSI COBOL compiler available
 F indicates ANSI FORTRAN compiler available
 (2) EI indicates computer may be used to support the emission inventory
 AQ indicates computer may be used to support the air quality system
 (3) Does not have ANSI compilers

Table B-1 Computational Facilities Available to State Agencies

TABLE B-2
LIST OF COMPUTER BASED SYSTEMS CURRENTLY IN USE

SYSTEM	ALL	INDENT	SCC	UNITS	SRC DEF	DATA TYPES	FINAL SPT	AVAIL TO STATES
1. IBM Starter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2. NY APESMS	No	Yes	No	No	No	Yes	Yes	Yes
3. ILL	No	No	No	Yes	Yes	No	No	No
4. MICH	No	No	No	NR	NR	NR	NR	Yes
5. WIS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6. TEXAS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
7 NEW MEXICO	Yes	Yes	Yes	Yes	Yes	Yes	NR	No
	4/3	5/2	4/3	5/1	5/1	5/1	4/1	4/2

TABLE B-3
COMPILATION OF EMISSION INVENTORY SOURCES

Region	State	NEDS*	Point Sources	Survey Results	
				Reported Area Sources Number	Method
I	Connecticut	477	4000-5000	9200	Conn. grid
	Massachusetts	1048	800	variable grids	UTM and MASS
	Rhode Island	164	100	0	none
	Maine	382	650	unknown	region
	New Hampshire	287	578	10	county
	Vermont	146	500		counties
II	New York	-	150,000	0	none
	New Jersey	1469	110,000	0	none
	Puerto Rico	343	500	0	none
	Virgin Islands	85	85	3	counties
IV	Florida	205	3,000	67 + grids	counties, UTM
V	Illinois	2695	15,000	96	counties
	Michigan	1124	12,000	not reported	not reported
	Wisconsin	897	500	72	counties
	Minnesota	716	not reported	not reported	not reported
	Ohio	3242	not reported	not reported	not reported
	Indiana	1616	9,000	not reported	not reported
	Missouri	512	300	115	counties
VI	New Mexico	1177	not reported	32	counties
	Texas	4027	not reported	not reported	not reported
	Arkansas	694	not reported	72	counties
	Oklahoma	823	not reported	76	counties
	Louisiana	1250	1,000	64	counties
VII	Missouri	512	300	115	counties
	Nebraska	210	300	93	counties
	Iowa	-	4,500	100	counties
	Kansas	346	5,000	not reported	not reported
IX	California	2688	4000-6000	58	counties
	Nevada	300	200	16	counties
	Hawaii	476	400	6	counties
	Guam	12	20	not reported	not reported

* NEDS - data extracted from NEDS summary report dated November 6, 1973. Data entries are numbers of "Plant-Points."

TABLE B-4

SUMMARY OF STAFF INCREASES AND IMPACTS
OCCASIONED BY SEMI-ANNUAL REPORT
OF EMISSION INVENTORY DATA

<u>Question 17</u>		<u>% Increase</u>	<u>No Increase</u>	<u>Impact</u>	<u>Prev Rpt</u>
C	Connecticut	100%	1/2	decrease manpower	yes
M	Massachusetts	not reported			NR
M	Rhode Island	no increase		none	yes
M	Maine	not reported			NO
M	New Hampshire	no increase		none	NO
M	Vermont	no increase		none	NR
C	New York	no increase		none	NO
M	New Jersey	no increase		none	NO
M	Puerto Rico	no increase		none	yes
M	Virgin Islands	no increase		none	NO
M	Florida	unknown		unknown	yes
C	Illinois	not reported		manpower from other section	NO
C	Michigan	no increase		none	yes
C	Wisconsin	not reported			yes
M	Minnesota	not reported			yes
M	Ohio	100%		manpower from other section	NO
M	Indiana	no increase			NO
C	New Mexico	no increase			NO
C	Texas	no increase			yes
M	Arkansas	no increase			NO
M	Oklahoma	no increase			NO
M	Louisiana	no increase			NO
M	Missouri	small	1	no impact	yes
C	Nebraska	no increase			yes
C	Iowa	no increase			yes
M	Kansas	no increase			NO
M	California	yes		unknown	NO
M	Nevada	no increase			yes
M	Hawaii	not reported			NO
M	Guam	no increase			NO

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4. TITLE AND SUBTITLE State Air Data Information Survey		5. REPORT DATE January 1974
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) T. H. Lewis		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS International Business Machines Corporation Federal Systems Division 18100 Frederick Pike Gaithersburg, Maryland 20760		10. PROGRAM ELEMENT NO. 2AE132
		11. CONTRACT/GRANT NO. 68-02-1008
12. SPONSORING AGENCY NAME AND ADDRESS Environmental Protection Agency National Air Data Branch Research Triangle Park, NC 27711		13. TYPE OF REPORT AND PERIOD COVERED Final
		14. SPONSORING AGENCY CODE
15. SUPPLEMENTARY NOTES		
16. ABSTRACT <p>The results of the State Air Data Survey were based on the states for which information was available in a timely fashion. The techniques presently used to store, access and maintain emission inventory and air quality files; significant problems associated with maintaining and using such files; and anticipated problems in meeting the proposed Federal regulations for the State quarterly and semi-annual reporting requirements, especially as related to providing data in standard EPA formats were addressed in this survey.</p>		
17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Computer Automatic Data Processing (ADP) Air Pollution Systems Aerometric Survey Information Systems, Emissions	NEDS SAROAD NADB National Emission Data System Storage of Retrival of Aerometric Data	13 B
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