
**PRELIMINARY REPORT
OF A STATE AND
LOCAL AIR POLLUTION
CONTROL AGENCY
MANPOWER AND
TRAINING SURVEY**



Conducted in April, 1971

By The U.S.
ENVIRONMENTAL PROTECTION
AGENCY

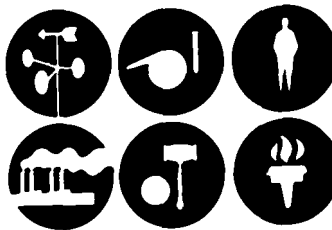


Office of Air Programs
Office of Manpower Development

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Research Triangle Park, North Carolina 27711



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The Environmental Protection Agency, Office of Air Programs gratefully acknowledges the assistance provided by all state and local air pollution control agencies.

Information collected in this survey will be used to guide the Office of Manpower Development in providing responsive manpower and training assistance.

We also wish to acknowledge the assistance provided by the nine agencies that participated in the November 1970 pilot study. Constructive criticism offered by agency personnel on the methods, design, procedures and the draft questionnaire were most helpful and contributed toward the success of this all-agency survey.

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I. INTRODUCTION

The 1967 Amendments to the Clean Air Act (42 U.S.C. 1857-1857i) section 305(b) directed the Secretary of Health, Education and Welfare to "make a complete investigation and study to determine (1) the need for additional trained state and local personnel to carry out programs assisted pursuant to this Act and other programs for the same purpose as this act; (2) means of using existing Federal training programs to train such personnel; and (3) the need for additional trained personnel to develop, operate, and maintain those pollution control facilities designed and installed to implement air quality standards."

This task was completed and a "Manpower and Training Needs for Air Pollution Control" Report was made to Congress in June 1970. In the Report, it was estimated by means of a Predictive Manpower Model that state and local air pollution control agencies would require 8,000 positions by 1974 to implement the Clean Air Act of 1967. The 1974 target of 8,000 is a conservative estimate since the model did not take into consideration the 1970 Amendments to the Clean Air Act which place an even greater workload on the control agencies than did the 1967 Act.

No additional manpower studies were required by the 1970 Amendments to the Clean Air Act; however, since state and local agencies are in a period of rapid growth, it is especially important that the Office of Air Programs have current and reliable information upon which to develop and implement programs on a priority basis. In addition, the

successful implementation of effective air pollution control programs depends on sufficient qualified manpower in state and local air pollution control agencies.

This study was undertaken to evaluate the current and projected manpower needs of air pollution control agencies and to identify significant staffing problems of these agencies. In order to maintain current data and provide meaningful manpower and training assistance programs for the agencies, it will be necessary to conduct similar manpower surveys of control agencies on a continuing basis.

This is a preliminary report including the highlights of the study. A comprehensive report is now being written and will be published in early 1972.

II. SUMMARY

The actual number of filled full-time positions has risen from 2,300 in 1969 to 4,205 in 1971, an increase of 1,905 positions. The Survey indicated a total of 5,111 budgeted positions, which includes 4,205 full-time, 457 part-time and 449 vacant positions. There were 2,837 budgeted positions in 1969. The vacancy rate (based on full-time budgeted positions) has been reduced from 18.9 percent in 1969 to 9.6 percent in 1971. The number of filled positions, as estimated by air pollution control directors, is expected to increase to 7,054 by 1974.

The major concentrations of manpower are in EPA Regions IX, II, and V, while the lower concentrations of manpower are reported in EPA Regions VII, VIII, and X. The total number of agencies has increased from 241 in 1969 to 264 in 1971. A comparison of the size of air pollution control agencies indicates a trend toward larger staffs. For example, in 1969, 55.6 percent of the agencies had 4 positions or less, however, in 1971 only 26.6 percent of the agencies fall into this category. Agencies reporting 1-2 positions have dropped from 39.4 percent in 1969 to 11.4 percent in 1971.

Agency officials indicated in the Survey that their manpower recruitment problems still include low salary levels and lack of

trained qualified applicants. These problems are especially evident in the smaller agencies. Another frequently cited reason for not filling vacancies even when positions have been allocated and budgeted is a freeze on hiring. Approximately one-third of the agencies did not anticipate problems in filling vacant positions.

Personnel with a wide variety of academic backgrounds are employed in control agencies. Nearly half of all positions are filled by personnel with engineering, biological and physical science and health training. Sixty percent of agency staffs hold degrees beyond high school. Five percent hold two year associate degrees, 44 percent bachelor degrees, 10 percent masters, and one percent doctorate. At the end of April 1971, 204 agencies reported a total of 449 vacant positions, with the greatest need for engineers.

Salaries in agencies are increasing. In 1969 the Manpower Report showed the salary levels for engineers were 30-50 percent below the median level for engineers with comparable jobs in industry. Comparisons of salary levels with various economic indicators will be included in the final report of this study.

Engineers comprise the largest single professional occupational group and account for 26 percent of the total staff. Seventeen percent of the engineers work in engineering positions;

the remaining function in such capacities as agency directors and air pollution specialists. The most common types of engineers are chemical, mechanical and civil.

Personnel in state agencies spend the greatest portion of their time performing technical services, whereas local and multijurisdictional agency personnel reportedly spend the highest percentage of their efforts in enforcement activities.

III. SURVEY FINDINGS

Highlights of the findings of the survey are presented in this section. Characteristics of state, local and multijurisdictional air pollution control agencies relative to number of agencies, budget information, manpower (including filled and vacant positions), and obstacles agencies face in filling their vacancies are presented. Information concerning educational qualifications of agency manpower including degrees, major fields, and certificates is discussed. Data regarding percentage of effort devoted to administrative, technical, engineering and enforcement activities in control agencies are included. In addition, there are projections of manpower growth from FY 72-75 as viewed by air pollution control agency directors. Comparison of 1971 manpower data to 1969 data from the Manpower Report is also included.

Occupational categories, functional descriptions and terms used in this report are defined in Appendices A, B, and C, respectively.

III. SURVEY FINDINGS

A. Agencies

A total of 264 air pollution control agencies were identified in this Survey (Table III-A-1). Agencies are staffed with full-time and/or part-time personnel. Twenty-eight agencies are staffed with part-time personnel only.

Thirty percent of the 264 agencies are staffed with 5-8 positions. Twenty-seven percent have 4 or less positions and 10 percent of the agencies have 33 or more positions.

The 264 air pollution control agencies include 53 state (Table III-A-2), 167 local (Table III-A-3) and 44 multijurisdictional agencies (Table III-A-4).

TABLE III-A-1

DISTRIBUTION OF AGENCIES BY SIZE
BASED ON CLASSIFICATION OF POSITIONS

(April 1971)

State, Local and Multijurisdictional Agencies*

Agency Size (No. Positions)	Based on Full-Time Positions Only		Based on Full-Time and Part-Time Positions	
	No. Agencies	Percent	No. Agencies	Percent
1-2	51	21.6	30	11.4
3-4	38	16.1	40	15.2
5-8	47	19.9	78	29.5
9-16	41	17.4	47	17.8
17-32	32	13.5	42	15.9
33-64	14	5.9	13	4.9
65-128	6	2.5	7	2.6
129 or >	7	3.0	7	2.6
TOTAL	236	100%	264	100%

*See Appendix C for Definitions

TABLE III-A-2

DISTRIBUTION OF AGENCIES BY SIZE
BASED ON CLASSIFICATION OF POSITIONS

(April 1971)

State Agencies

Agency Size (No. Positions)	Based on Full-Time Positions Only		Based on Full-Time and Part-Time Positions	
	No. Agencies	Percent	No. Agencies	Percent
1-2	2	3.8	1	1.9
3-4	4	7.7	5	9.4
5-8	6	11.5	3	5.7
9-16	12	23.1	12	22.6
17-32	17	32.7	21	39.6
33-64	5	9.6	4	7.5
65-128	2	3.8	3	5.7
129 or >	4	7.7	4	7.5
TOTAL	*52	100%	53	100%

*Includes Washington, D.C., Puerto Rico and Virgin Islands.

TABLE III-A-3

DISTRIBUTION OF AGENCIES BY SIZE
 BASED ON CLASSIFICATION OF POSITIONS
 (April 1971)

Local and Multijurisdictional Agencies

Agency Size (No. Positions)	Based on Full-Time Positions Only		Based on Full-Time and Part-Time Positions	
	No. Agencies	Percent	No. Agencies	Percent
1-2	49	26.6	29	13.7
3-4	34	18.5	35	16.6
5-8	41	22.3	75	35.6
9-16	29	15.8	35	16.6
17-32	15	8.1	21	9.9
33-64	9	4.9	9	4.3
65-128	4	2.2	4	1.9
129 or >	3	1.6	3	1.4
TOTAL	184	100%	211	100%

III. SURVEY FINDINGS

B. Budget

The budget levels for air pollution control agencies range from \$28,500 to \$4,144,400 (Table III-B-1). "Budget" includes both state and local funds and federal grant-in-aid monies. These data represent the mean budgets for each type of agency within a given size class.

TABLE III-B-1

TOTAL MEAN BUDGETS FOR STATE AND
LOCAL AIR POLLUTION CONTROL AGENCIES

(In Thousands of Dollars)

April 1971

Agency Size [Positions]	Type of Agencies		
	State	Local	Multijurisdictional
1-2	43.3	28.5	57.2
3-4	40.6	51.8	44.7
5-8	89.6	101.3	88.6
9-16	177.0	181.1	156.0
17-32	427.8	321.6	385.5
33-64	922.9	541.0	757.7
65-128	924.3	1573.0	2051.5
129 or >	2101.0	4144.4	-

III. SURVEY FINDINGS

C. Manpower

A total of 5,111 budgeted positions are in 264 state, local and multijurisdictional air pollution control agencies (Table III-C-1). Of this total, 4,205 are full-time (82.3%), 457 are part-time (8.9%) and 449 are vacant (8.8%) (assumed to be full-time positions).

Table III-C-2 shows the distribution of control agencies stratified by size into eight groups based on full-time positions only compared with full-time and part-time positions. As indicated, there are 236 agencies based on full-time positions and 264 agencies when part-time positions are added. There are 28 agencies of the 264 staffed by part-time employees only. While many of these positions are truly part-time, some of them represent full-time employees of environmental agencies who devote a portion of their time to air pollution activities.

Of the 4,662 filled positions, 17.2 percent are engineering positions, the largest single professional group. The largest occupational category is composed of inspectors who comprise 18.5 percent of the total staff. Meteorologists are the smallest professional category and account for only 1 percent of all the filled positions. Agencies in EPA Regions V, IX, and II are staffed with the largest number of positions while Regions VIII, VII and X have the smallest number of filled positions (Table III-C-3).

The 449 vacancies are almost equally divided between state and local agencies, with only 7.3 percent of the vacancies in multijurisdictional agencies. Agencies in EPA Regions III, V, II and IV reported the largest number of vacancies, and agencies in Regions VIII, I and VII reported the least vacancies (Table III-C-4). The largest number of vacancies is in the 17-32 man agencies (Table III-C-5).

For the 449 vacant positions in the 264 agencies, 492 responses related to problems in filling vacancies were reported (Table III-C-6). More than one obstacle to filling vacancies was reported for some vacant positions. The most frequently stated obstacle was the "lack of trained, qualified applicants". Another significant problem was "inadequate salary". This was followed by "government freeze on hiring". Of the responses, 35.8 percent anticipated no difficulty in hiring.

TABLE III-C-1

BUDGETED POSITIONS IN AIR POLLUTION CONTROL
AGENCIES BY REGION AND
BY TYPE OF POSITIONS

April 1971

Region	Type of Position			Total
	Filled		Vacant	
	Full-Time	Part-time		
I	196	55	8	259
II	762	35	80	877
III	497	35	88	620
IV	563	56	63	682
V	717	120	87	924
VI	291	42	43	376
VII	133	20	11	164
VIII	82	35	7	124
IX	776	53	43	872
X	188	6	19	213
TOTAL	4205	457	449	5111
PERCENT	82.3	8.9	8.8	100

TABLE III-C-2
AVERAGE NUMBER OF POSITIONS PER
AGENCY BASED ON AGENCY SIZE
(For State, Local and Multijurisdictional
Air Pollution Control Agencies)
(April 1971)

Full-Time Positions Only

Agency Size (No. Positions)	Number of Agencies	Number of Positions	Average No. Positions/Agency
1-2	51	73	1.4
3-4	38	130	3.4
5-8	47	311	6.6
9-16	41	472	11.5
17-32	32	744	23.2
33-64	14	609	43.5
65-128	6	472	78.7
129 or >	7	1394	199.1
TOTAL	236	4205	17.8

Full-Time and Part-Time Positions

Agency Size (No. Positions)	Number of Agencies	Number of Positions	Average No. Positions/Agency
1-2	30	47	1.6
3-4	40	147	3.7
5-8	78	491	6.3
9-16	47	524	11.1
17-32	42	949	22.6
33-64	13	551	42.4
65-128	7	543	77.6
129 or >	7	1410	201.4
TOTAL	264	4662	17.7

TABLE III-C-3
NUMBER AND PERCENT OF FILLED POSITIONS IN AIR POLLUTION CONTROL AGENCIES
BY REGION AND BY OCCUPATIONAL TITLE (April 1971)

Occupational Title	I	II	III	IV	V	VI	VII	VIII	IX	X	TOTAL	%
Director	16	23	22	32	48	21	15	15	26	14	232	5.0
Supervisor	12	51	42	41	58	22	15	7	48	17	313	6.7
Engineer I	15	66	51	51	43	14	14	11	75	6	346	7.4
Engineer II	39	83	52	52	89	14	7	9	91	22	458	9.8
Chemist I	4	16	17	26	20	15	3	5	25	4	135	2.9
Chemist II	15	19	21	37	40	15	10	4	26	13	200	4.3
Meteorologist I	-	5	1	2	-	2	-	-	4	-	14	0.3
Meteorologist II	-	3	4	2	5	4	-	2	7	4	31	0.7
Specialist I	7	23	36	41	8	27	4	7	11	7	171	3.7
Specialist II	11	37	21	20	20	24	11	8	22	8	182	3.9
Technician I (Trainee)	3	10	27	28	44	3	3	5	20	-	143	3.1
Technician II	10	35	36	33	32	18	9	3	54	15	245	5.3
Technician III	3	12	14	19	12	4	2	2	17	10	95	2.0
Inspector I (Trainee)	1	9	28	8	37	13	3	3	21	1	124	2.7
Inspector II	26	113	35	41	96	38	19	11	120	15	514	11.0
Inspector III	29	41	10	30	59	10	5	2	34	6	226	4.8
Aide I	1	15	4	2	8	4	2	-	4	1	41	0.9
Aide II	5	24	2	10	4	6	3	1	1	1	57	1.2
Adm., Clerical, All Other	54	212	109	144	214	79	28	22	223	50	1135	24.3
Total	251	797	532	619	837	333	153	117	829	194	4662	
%	5.4	17.1	11.4	13.3	17.9	7.1	3.3	2.5	17.8	4.2		100.0

*See Appendix A for Definitions of Codes

TABLE III-C-3

NUMBER AND PERCENT OF FILLED POSITIONS
IN AIR POLLUTION CONTROL AGENCIES BY REGION
AND BY OCCUPATIONAL TITLE (APRIL 1971)

TABLE III-C-4

BUDGETED VACANCIES IN AIR POLLUTION CONTROL AGENCIES

BY REGION AND BY AGENCY TYPE

(April 1971)

Region	Type of Agency			Total
	State	Local	Multijurisdiction	
I	6	2	0	8
II	55	18	7	80
III	23	64	1	88
IV	35	28	0	63
V	11	61	15	87
VI	26	17	0	43
VII	3	6	2	11
VIII	4	2	1	7
IX	17	22	4	43
X	13	3	3	19
TOTAL	193	223	33	449
PERCENT	43.0	49.7	7.3	100

TABLE III-C-5

NUMBER OF VACANCIES IN
AIR POLLUTION CONTROL AGENCIES BY
AGENCY TYPE AND SIZE

(April 1971)

Agency Size	Type of Agency			Total	%
	State	Local	Multijuris.		
1-2	3	16	5	24	5.3
3-4	2	17	2	21	4.7
5-8	1	28	10	39	8.7
9-16	5	23	3	31	6.9
17-32	66	22	7	95	21.1
33-64	44	22	4	70	15.6
65-128	13	71	2	86	19.2
129 or >	59	24	-	83	18.5
Total	193	223	33	449	
Percent	43.0	49.7	7.3		100.0

TABLE III-C-6

OBSTACLES TO FILLING BUDGETED
VACANCIES IN STATE AND LOCAL
AIR POLLUTION CONTROL AGENCIES
(April 1971)

Obstacles to Filling Vacant Positions	Type of Agency		Total	Percent
	State	Local and Other		
No difficulty expected	75	101	176	35.8
Lack of trained, qualified applicants	40	58	98	19.9
Salary Inadequate	10	53	63	12.8
Government Freeze on hiring	31	17	48	9.7
Lack of Funds or Grant	11	24	35	7.1
Awaiting exam results on applicant accept.	14	12	26	5.3
Personnel system problems	13	0	13	2.6
Limited Space	5	0	5	1.0
Other	7	21	28	5.7
Total	206	286	492	
Percent	41.9	58.1		100

Note: "Other" category includes no reason stated, lack of supervisory personnel, relocation of office, etc.

III. SURVEY FINDINGS

D. Salaries

Salaries of filled positions in air pollution control agencies vary considerably for each occupational category (Table III-D-1). For example, agency directors' salaries range from \$7,300 to \$34,000 per year, with a mean low of \$15,300 to a mean high of \$18,100 per year. The wide salary range shows no apparent relationship to the type of agency. Salary range is reported only for full-time positions because it was not feasible to convert a part-time salary to an annual salary with any degree of accuracy.

Mean salaries of vacant positions are generally consistent with those of filled positions; however, some differences do exist (Table III-D-2). These differences may be due in part to the relatively small number of vacant positions (449) compared to the number of filled full-time positions (4205).

Note: The salary data in Table III-D-1 represent ranges for a specified position and therefore are not necessarily the actual salary for any given individual.

TABLE III-D-1

SALARIES OF FILLED POSITIONS IN AIR POLLUTION CONTROL AGENCIES (APRIL 1971)
(IN THOUSANDS OF DOLLARS)

Occupational Title	T Y P E O F A G E N C I E S							
	State Range		Local Range		Multijuris. Range		Mean Range for All Agencies	
	Low	High	Low	High	Low	High	Low	High
Director	7.7	29.9	7.3	34.6	8.8	31.0	15.3	18.1
Supervisor	7.6	27.0	6.0	29.0	6.4	24.0	13.5	16.6
Engineer I	6.2	19.3	8.4	16.4	8.0	14.7	10.5	12.9
Engineer II	7.4	22.6	9.0	21.7	8.5	21.0	12.5	15.5
Chemist I	6.2	13.6	5.0	14.5	6.6	14.4	8.6	10.6
Chemist II	5.0	18.1	6.0	17.2	6.9	17.4	10.0	12.5
Meteorologist I	7.6	13.3	7.9	15.3	-	-	10.3	12.2
Meteorologist II	7.0	17.7	8.3	17.5	10.2	17.0	10.9	14.2
Specialist I	6.5	19.3	5.1	15.3	5.0	13.9	8.3	10.6
Specialist II	5.6	20.4	4.9	16.1	6.4	21.0	9.7	12.2
Technician I (Trainee)	2.9	11.1	4.1	13.5	4.3	13.1	7.0	9.0
Technician II	3.5	13.9	4.0	13.5	5.6	16.2	7.9	9.8
Technician III	5.2	18.5	5.8	16.5	7.0	17.0	8.6	10.9
Inspector I (Trainee)	5.2	18.0	4.3	14.9	6.1	11.8	7.4	9.7
Inspector II	4.7	13.8	4.5	21.0	5.7	12.8	8.4	10.3
Inspector III	6.1	13.6	5.0	17.2	6.2	17.4	9.3	11.2
Aide I	4.6	10.0	3.4	8.0	5.1	8.3	5.8	7.0
Aide II	4.3	10.0	5.4	11.8	6.2	11.0	6.7	8.0
Adm., Clerical, All Other	2.9	22.6	3.4	21.4	3.8	26.0	6.6	8.0

- None Reported

* See Appendix A for Definitions

TABLE III-D-1

SALARIES OF FILLED POSITIONS
IN AIR POLLUTION CONTROL AGENCIES (APRIL 1971)
(IN THOUSANDS OF DOLLARS)

TABLE III-D-2

SALARIES OF VACANT POSITIONS IN AIR POLLUTION CONTROL AGENCIES (APRIL 1971)
(IN THOUSANDS OF DOLLARS)

Occupational Title	T Y P E O F A G E N C I E S							
	State Range		Local Range		Multijuris. Range		Mean Range for All Agencies	
	Low	High	Low	High	Low	High	Low	High
Director	16.8	20.2	14.0	20.0	-	-	15.3	19.4
Supervisor	11.7	22.9	12.6	28.1	12.2	17.3	15.2	20.1
Engineer I	8.0	15.0	8.0	15.3	10.0	15.9	10.1	12.3
Engineer II	9.6	17.2	8.4	19.0	10.6	14.8	11.7	14.8
Chemist I	6.6	11.5	6.3	12.9	-	-	8.4	10.1
Chemist II	10.0	15.0	9.0	16.1	12.0	15.4	11.2	14.4
Meteorologist I	7.2	14.9	-	-	-	-	9.1	12.8
Meteorologist II	10.0	12.0	-	-	-	-	10.0	12.0
Specialist I	7.4	17.7	4.5	12.3	-	-	8.5	10.9
Specialist II	9.0	18.1	4.9	15.6	-	-	9.4	11.6
Technician I (Trainee)	3.5	10.0	5.5	10.1	7.1	7.8	6.6	8.0
Technician II	4.0	11.6	5.4	10.4	6.1	7.3	7.2	8.8
Technician III	4.7	5.6	5.2	13.5	8.0	11.0	7.2	9.0
Inspector I (Trainee)	5.2	13.0	6.8	12.2	7.0	7.3	8.1	10.1
Inspector II	5.4	13.0	4.5	13.5	7.2	10.2	7.7	9.5
Inspector III	7.7	13.0	5.0	11.4	-	-	7.5	9.4
Aide I	-	-	4.8	5.7	7.5	8.0	6.8	7.4
Aide II	3.8	-	3.4	9.3	6.2	9.4	5.3	6.8
Adm., Clerical, All Other	3.9	20.4	33.4	24.2	5.1	15.0	6.5	8.1

*See Appendix A for definitions

-None Reported

TABLE III-D-2

SALARIES OF VACANT POSITIONS
IN AIR POLLUTION CONTROL AGENCIES (APRIL 1971)
(IN THOUSANDS OF DOLLARS)

III. SURVEY FINDINGS

E. Education

Of the 4662 filled positions, 3036 degrees in major fields of study were reported (Table III-E-1). A total of 1204 engineering degrees were reported, the largest single professional category in control agencies. The second highest number was 910, in biological and physical sciences. The 433 "other" include degrees in law, medicine or unspecified areas. These statistics represent total degrees and include more than one degree within the same major field or in different fields reported by some individuals.

Degrees were grouped into 9 major academic fields for this preliminary report as indicated in Table III-E-1. Data were collected on specific degrees in each of the major fields and will be included in the final report.

TABLE III-E-1

MAJOR FIELDS OF STUDY REPORTED BY EMPLOYEES OF
STATE AND LOCAL AIR POLLUTION CONTROL AGENCIES (April 1971)

Major Fields of Study	OCCUPATIONAL CATEGORY																			Total
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	
Agriculture	5	6	2	1	2	8	-	-	12	4	1	2	1	2	8	2	-	-	2	58
Biol., Phys. Science	68	80	27	53	117	182	9	13	81	91	16	23	14	15	45	37	4	2	33	910
Social Sciences	4	4	-	-	1	2	1	1	3	4	2	1	3	3	13	3	-	1	18	64
Business, Commerce	8	15	5	7	-	1	-	1	6	2	1	2	-	4	19	4	-	-	18	93
Mathematics	1	6	3	2	2	3	1	1	5	-	2	3	1	2	3	1	-	-	6	42
Lib. Arts, Humanities	2	4	-	2	-	1	-	1	3	9	1	4	-	4	4	3	-	-	16	54
Education	4	7	-	4	2	2	-	5	5	5	1	2	-	4	14	3	1	1	4	64
Health Professions	40	33	-	6	3	3	-	-	-	9	-	1	5	1	1	2	-	-	10	114
Engineering	146	185	317	403	6	14	1	6	25	15	12	9	8	3	20	12	-	-	22	1204
Other*	51	45	15	39	13	17	1	9	15	29	12	32	11	9	30	34	-	1	70	433
Total	329	385	369	517	146	233	13	37	155	168	48	79	43	47	157	101	5	5	199	3036

*Other Category Includes: Law, General Science, Medicine and Degrees
with no field specified

- None Reported

III. SURVEY FINDINGS

F. Functional Activities

Approximately one-third of the effort in state air pollution control agencies is directed toward technical aspects of air pollution control and about one-sixth toward enforcement activities (Table III-F-1).

Local agencies, on the other hand, spend about one-third of their effort on enforcement and one-fifth in technical activities.

Multijurisdictional agencies are similar to local agencies in that about one-third of their work is devoted to enforcement and one-fourth related to technical aspects.

TABLE III-E-1

MAJOR FIELDS OF STUDY REPORTED
BY EMPLOYEES OF STATE AND LOCAL
AIR POLLUTION CONTROL AGENCIES (APRIL 1971)

TABLE III-F-1

FUNCTIONAL DESCRIPTION OF TIME SPENT
IN AIR POLLUTION CONTROL ACTIVITIES
BY AGENCY TYPE

(April 1971)

Agency Type	Percent of Effort in Each Functional Activity				
	Management	Technical	Enforcement	Engineering	Other
State	21	34	16	13	16
Local	14	23	30	13	20
Multijuris- dictional	20	25	34	11	10

NOTE: See Appendix B for Definitions of Functional Descriptions.

III. SURVEY FINDINGS

G. Manpower Projections

Based on the Predictive Manpower Model, it was estimated that state and local air pollution control agencies would require 8000 people by 1974 to implement the provisions of the Clean Air Act of 1967. It should be emphasized that this estimate was made prior to the 1970 Amendments to the Clean Air Act and therefore the 8000 estimate is considered a conservative number at this time.

At the present time, the actual number of positions is slightly in excess of the Predictive Manpower Model estimates. According to projected positions reported by the agencies, the number of positions will correspond to the Model estimates by the middle of FY 1972 (Table III-G-1). After this period the manpower needs predicted by the Model will outnumber the positions projected by the agencies, resulting in a manpower gap.

TABLE III-G-1

PROJECTED STAFF OF
AIR POLLUTION CONTROL AGENCIES
FISCAL YEARS 1972-1975
(April 1971)

FY 71 Filled Positions: 4662	Fiscal Years			
	1972	1973	1974	1975
Reported Staff Projections	5310	4942	5418	5584
Manpower Adjustment-A	717	1416	1504	1614
Adjusted Staff Projections-A	6027	6358	6922	7198
Manpower Adjustment-B	210	78	132	65
Adjusted Staff Projections-B	6237	6436	7054	7263

NOTE: Staff projections reported in the Survey have been adjusted to eliminate the influence of agencies who did not respond for all Fiscal Years:

- A: This adjustment is based on the assumption that non-responding agencies will not grow, during the above time period, beyond the staffing level last reported.
- B: This adjustment is based on the assumption that non-responding agencies will grow during the above time period, at the same rate as the agencies who responded.

IV. COMPARISONS

Comparisons, based on full-time positions, indicate that the number of air pollution control agencies in 1971 is slightly less than in 1969 (Table IV-1). The number of 1-2 man agencies has dropped from 95 in 1969 to 51 in 1971. The trend is toward fewer but larger agencies.

The number of full-time budgeted positions has increased from 2,837 in 1969 to 4,654 in 1971, assuming that all vacancies are full-time positions (Table IV-2). The actual number of full-time employees has increased from 2,300 to 4,205 during the same time period. The vacancy rate (based on full-time positions) has decreased from 18.9 percent to 9.6 percent.

The average number of positions in state air pollution control agencies has increased steadily from 8.6 positions per agency in 1961 to 31.4 positions in 1971 (Table IV-3).

The average number of positions in local air pollution control agencies has doubled from approximately 10 positions per agency in 1961, 1967 and 1969 to 19.5 positions in 1971 (Table IV-4). Local agencies with 3 or more employees have increased their average staff size from 23.0 in 1961 to 29.7 in 1971.

TABLE IV-1 :

COMPARISON OF ALL STATE AND LOCAL
AIR POLLUTION CONTROL AGENCIES BY
SIZE RANGE BY INDICATED TIME FRAMES

Agency Size Range	Number of Agencies and Percentage			
	1969	%	1971	%
1-2 Positions	95	39.4	51	21.6
3-4 Positions	39	16.2	38	16.1
5-8 Positions	43	17.8	47	19.9
9-16 Positions	29	12.0	41	17.4
17-32 Positions	21	8.7	32	13.6
33-64 Positions	5	2.1	14	5.9
65-128 Positions	4	1.7	6	2.5
129 or More	5	2.1	7	3.0
TOTALS	241	100.0	236*	100.0

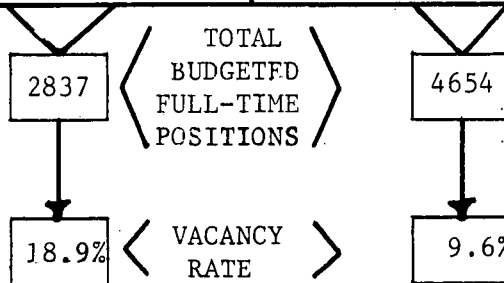
*Based on Full-Time Positions ONLY. There are 264 agencies if part-time positions are included.

TABLE IV-2

BUDGETED FULL-TIME POSITIONS
IN AIR POLLUTION CONTROL AGENCIES
BY REGION FOR 1969 AND 1971

(April 1971)

Region	Year and Type of Position			
	1969		1971	
	Full-Time*	Vacant*	Full-Time	Vacant
I	72	41	196	8
II	531	150	762	80
III	163	90	497	88
IV	189	92	563	63
V	379	81	717	87
VI	141	20	291	43
VII	60	28	133	11
VIII	74	2	82	7
IX	618	31	776	43
X	73	2	188	19
TOTAL	2300	537	4205	449



*These numbers have been adjusted to conform with EPA Regional Boundaries.

TABLE IV-3

NUMBERS OF STATE AGENCIES AND FULL-
TIME POSITIONS BASED ON AGENCY SIZE
(Comparison of 1971 Survey with
1970 Manpower Report)

Agency Size Range (Full-Time Positions)	Number of Agencies in Range				Number of Positions in Range				Average Number of Positions Per Agency in Range			
	1961	1967	1969	1971	1961	1967	1969	1971	1961	1967	1969	1971
1-2	9	8	7	1	8	10	8	2	1	1	1	2.0
3-4	2	4	8	4	6	12	26	13	3	3	3	3.2
5-8	2	10	5	6	15	73	37	40	8	7	7	6.7
9-16	1	8	13	12	14	96	142	146	14	12	11	12.2
17-32	2	3	9	15	42	67	224	385	21	22	25	25.7
33-64	1	1	1	5	62	44	36	225	62	44	36	45.0
65-128	-	3	2	2	-	266	177	154	-	88	89	77.0
129 or >	-	-	2	4	-	-	347	572	-	-	174	143.0
TOTAL	17	37	47	49	147	568	997	1537	8.6	15.4	21.2	31.4

Excludes: Washington, D.C., Puerto Rico, and Virgin Islands to allow for direct comparison.

-None Reported

TABLE IV-3

NUMBERS OF STATE AGENCIES AND FULL-
TIME POSITIONS BASED ON AGENCY SIZE
(Comparison of 1971 Survey with
1970 Manpower Report)

TABLE IV-4
NUMBERS OF LOCAL AGENCIES AND FULL-¹
TIME POSITIONS BASED ON AGENCY SIZE
(Comparison of 1971 Survey with
1970 Manpower Report)

Agency Size Range (Full-Time Positions)	Number of Agencies in Range				Number of Positions in Range				Average Number of Positions Per Agency in Range			
	1961	1967	1969	1971	1961	1967	1969	1971	1961	1967	1969	1971
1-2	50	72	88	49	70	52	72	69	1.4	0.7	0.8	1.4
3-4	9	20	31	34	33	75	106	117	3.7	3.8	3.4	3.4
5-8	11	19	38	41	72	151	237	271	6.5	7.9	6.2	6.6
9-16	6	14	16	29	70	174	184	326	12.0	12.0	12.0	11.2
17-32	6	7	12	16	133	185	288	342	22.0	26.0	24.0	21.4
33-64	1	4	4	9	52	151	161	384	52.0	38.0	40.0	42.7
65-128	1	1	2	4	74	75	154	318	74.0	75.0	77.0	79.5
129 or >	1	3	3	3	373	695	638	822	373.0	232.0	213.0	274.0
TOTAL	85	140	194	*135	877	1558	1840	2628	10.3	11.1	9.5	19.5
Total Agencies with 3 or More Positions	35	68	106	86	807	1506	1768	2559	23.0	22.1	16.5	29.7

*Totals Include those agencies in Survey defined as "Local" and "Multijurisdictional".

¹Washington, D.C. is included above to allow for direct comparison to the Manpower Report.

TABLE IV-4

NUMBERS OF LOCAL AGENCIES AND FULL-TIME POSITIONS BASED ON AGENCY SIZE
(Comparison of 1971 Survey with
1970 Manpower Report)

V. METHODOLOGY

In preparation for this all-agency survey a pilot study was conducted in nine selected state and local air pollution control agencies in the fall of 1970. The purpose of the pilot study was to test methods and procedures of collecting data from agencies by a mail questionnaire and to evaluate the draft questionnaire. The pilot study demonstrated that the data required could be collected by using a mail questionnaire. As a result of this test, it was necessary to make minor modifications of some questions and definitions for the revised questionnaire used in the all-agency survey.

Questionnaires were mailed to 302 state and local air pollution control agencies which were identified in the Office of Air Programs grant files and the Air Pollution Control Association list of air pollution control agencies. Of the 302 possible agencies, 264 were identified and classified as state, local, or multijurisdictional agencies. The remaining 38 responded but indicated that they were no longer an agency, had been combined with another agency or were voluntary agencies that had previously received an air pollution grant but no longer functioned as control agencies.

Data were collected regarding each of the 264 agencies. All but five of the agencies responded by returning their completed questionnaires by mail. Visits to four agencies were made to assist them in completing their questionnaire. Information on one agency was obtained from a recent air pollution program grant application.

Each completed questionnaire returned by the agencies was edited and coded by the Office of Manpower Development staff. Data were then keypunched directly from the source document to minimize transcription errors. All keypunching was verified. A 60 percent random sample of the 264 agencies stratified by size was selected and validated against the keypunched data. An insignificant number of keypunching and coding errors was identified. Errors were corrected and data files were updated. Computer programs were written to compile data for the tables in this report.

This is a 100 percent survey of all state, local and multijurisdictional agencies. Most data presented are actual counts; any data adjusted for non-response to individual questions is indicated on the specific tables and explained in footnotes.

No data concerning training activities in state and local air pollution control agencies are presented in this preliminary report. These data are being analyzed and will be included in the comprehensive report scheduled for publication in November 1971.

The "administrative, clerical and other" occupational category (code 19) is non-specific. Therefore in many of the following analyses this category may show wide variation, appear unusually large, and could be misleading. Substantive conclusions should not be drawn from this category of information since it includes not only administrative and clerical personnel but professional categories such as lawyers, urban and transportation planners, computer specialists, and physicians. Future occupational classifications will be more specific and definitive.

APPENDIX A TITLES AND DEFINITIONS FOR AIR POLLUTION
CONTROL PERSONNEL (OCCUPATIONAL CATEGORIES)

Codes

AIR POLLUTION CONTROL DIRECTOR

- 01 Plans, organizes, and directs the professional, administrative, and technical activities of an air pollution control program; coordinates the program with local, state, regional, federal, and private agencies and organizations concerned with air pollution and related environmental activities; and evaluates program and personnel effectiveness and initiates improvements.

02

AIR POLLUTION CONTROL SUPERVISOR

Under the direction of the Air Pollution Control Director, with broad technical latitude, is responsible for planning a major segment of an air pollution control program; coordinating it with other segments of the program; supervising a professional, administrative, and technical staff; and acting for the Director as designated.

03

AIR POLLUTION CONTROL ENGINEER I

Under close supervision, makes beginning professional engineering analyses and evaluations of air pollution sources, problems, and permit plans; makes basic emission inventory calculations and assists in the development of emission reduction strategies; may assist in provision of professional and technical advice; may participate in special studies; may lead and assist in training program personnel; learns to perform more difficult engineering duties.

04

AIR POLLUTION CONTROL ENGINEER II

Under general supervision, with technical latitude, performs professional engineering work in an office or in the field; makes analyses and evaluations of air pollution sources, problems, and permit plans; calculates emission inventories and develops emission control and reduction strategies and emergency episode plans; provides professional and technical advice; plans and conducts special studies; assists in planning the air pollution control program; leads and trains program personnel.

05

AIR POLLUTION CONTROL CHEMIST I

Under close supervision, performs standardized chemical analyses of atmospheric contaminants; assists in the development of analytical procedures and measurement techniques; learns to perform more difficult analyses and to provide professional and technical advice on the chemistry of air pollution; may participate in special studies; may lead and assist in training program personnel.

06

AIR POLLUTION CONTROL CHEMIST II

Under general supervision, with technical latitude, performs professional chemical analyses of atmospheric contaminants; develops analytical procedures and measurement techniques for laboratory and field activities; provides professional and technical advice; plans and conducts special studies; assists in planning the air pollution control program; leads and trains program personnel.

07

AIR POLLUTION CONTROL METEOROLOGIST I

Under close supervision, performs beginning professional meteorological analyses and evaluations of meteorological and air pollution data; assists in the relation of meteorological elements to air pollution problems and preparation of periodic air quality forecasts; may participate in special studies; may lead and assist in the training of program personnel; learns to perform more difficult meteorological duties.

08

AIR POLLUTION CONTROL METEOROLOGIST II

Under general supervision, with technical latitude, makes professional meteorological analyses and evaluations of meteorological and air pollution data; relates meteorological elements to air pollution problems in control models; prepares periodic air quality forecasts; recommends implementation and termination of emergency episode plans; provides professional and technical advice; plans and conducts special studies; assists in planning the air pollution control program; leads and trains program personnel.

09

AIR POLLUTION CONTROL SPECIALIST I

Under close supervision, makes beginning professional level analyses and evaluations of air pollution sources, problems and permit plans; assists in complex inspections and investigations; assists in the development of recommendations and in the conduct of negotiations for improvement or modification of air pollutants conditions, initiation of enforcement action and provision of professional and technical advice; may participate in special studies; may lead and assist in the training of program personnel, learns to perform more difficult professional level duties.

10

AIR POLLUTION CONTROL SPECIALIST II

Under general supervision, with technical latitude, functions as a professional-level program representative; conducts complex inspections and investigations of reported violations; analyzes and evaluates air pollution sources, problems, and permit plans; develops recommendations and negotiates improvements or corrective actions; initiates enforcement actions; provides professional and technical advice; plans and conducts special studies; assists in planning the air pollution control program; leads and trains program personnel.

11

AIR POLLUTION CONTROL TECHNICIAN I (TRAINEE)

Under close supervision, following detailed directions, performs routine technical tasks in laboratory, field, and shop; assists higher-level staff installing, operating, calibrating and repairing a variety of equipment and instruments used in the air pollution control program; and participates in training.

12

AIR POLLUTION CONTROL TECHNICIAN II

Under supervision, following general directions, installs, calibrates, operates, modifies, maintains, and repairs a variety of equipment and instruments used in the air pollution control program; may assist professional staff conducting special studies; and may lead and assist in the training of lower-level staff.

13

AIR POLLUTION CONTROL TECHNICIAN III

Under general supervision, with technical latitude performs a broad range of technical duties of varying complexity in the laboratory, shop, and field; assists professional staff conducting special studies; and leads and trains lower-level staff.

14

AIR POLLUTION CONTROL INSPECTOR I (TRAINEE)

Under close supervision, following detailed directions, performs routine field surveillance, facility and equipment inspection, and complaint investigation and learns to perform more responsible tasks by observing and assisting higher-level staff and participating in training.

15

AIR POLLUTION CONTROL INSPECTOR II

Under supervision, following general technical directions, performs field surveillance, facility and equipment inspection, and complaint investigation; may assist professional staff conducting special studies; and may lead and assist in the training of lower-level staff.

16

AIR POLLUTION CONTROL INSPECTOR III

Under general supervision, with technical latitude, performs field surveillance, facility and equipment inspection, and complaint investigation; assists professional staff in conducting special studies; and leads and trains lower-level staff.

17

AIR POLLUTION CONTROL AIDE I

Under close supervision, following detailed directions, serves as a helper to a higher-level employee and learns to perform routine tasks.

18

AIR POLLUTION CONTROL AIDE II

Under close supervision, serves as a helper to higher-level employees and learns to perform more difficult tasks requiring some technical knowledge and skill.

19

ADMINISTRATIVE, CLERICAL AND ALL OTHER

Includes any category not included in above occupational categories.

APPENDIX B FUNCTIONAL DESCRIPTIONS

1. MANAGEMENT SERVICES

A. Policy, public relations, intergovernmental relations, and development of control strategies and plans: These functions include the variety of special activities required of an agency director and his immediate staff in order to conduct a meaningful and dynamic control program. As an agency increases in size, specialists such as systems analysts, public relations experts, and technical writers may be involved. For small agencies, these skills may be part of the duties of major supervisors.

B. Administrative and clerical support: This function includes budgeting, record keeping, filing, typing, and related work, as normally required to operate an agency. All clerical staff of the agency are included in this category for ease of tabulation.

C. Staff training: This function includes the activities of training officers and supervisors in providing on-the-job or formal group training.

2. TECHNICAL SERVICES

A. Laboratory operations: This function includes all laboratory support activities necessary for sources sampling, ambient air monitoring, and special studies.

B. Operation of monitoring network: This function relates to the routine servicing and operation of all sampling and meteorological instruments deployed in the field for continuous surveillance of air quality and diffusion characteristics. The data generated are used as input to diffusion models for prediction of future air quality and the development of control regulations; to determine the effectiveness of agency operation in reducing and/or preventing air pollution to forecast episode conditions, and for public information and education purposes.

C. Data processing: This function includes data reduction, processing, and statistical treatment for air sampling, meteorology, permit processing, emission calculations, and development of inspection schedules.

D. Special studies: This function includes a variety of special studies conducted for purposes of locating sampling stations, determining contribution of specific sources to ambient air pollution levels, and determining need for new regulations.

E. Instrument calibration and maintenance: This function includes those duties to ensure the proper operation of sampling, analytical, and meteorological instruments operated by the agency.

3. ENFORCEMENT SERVICES

A. Scheduled inspections for permit renewal: This function relates to the activities required of an air pollution inspector to determine whether all sources of pollution, operating under a permit are in compliance with the terms of that permit. The function includes travel time, inspection, and report preparation.

B. Complaint-handling and field patrol: This function includes the operation of a continuous field patrol to enforce regulations on open burning, visible emissions, odors, etc.

4. ENGINEERING SERVICES

A. Calculation of emission estimates: This function relates to the work done in estimating emission rates from various sources and source categories to provide information on program effectiveness, potential future problems within an agency's area of jurisdiction, location of sampling stations, and need for new regulations.

B. Permit system: This function covers all the work involved in reviewing plans for potential new sources of air pollution; consultation with builder, owner and/or other interested parties to effect changes, where necessary, making inspections to ensure that what is done conforms to the plans; and appearing before hearing boards to substantiate findings. It is assumed that permits are issued to prevent pollution in a comprehensive manner and that the system includes an authority to construct and a permit to operate.

C. Development of control regulations, preparation of technical reports on control and review of industrial control plan for episodes: These areas are generally project-oriented or considered part-time responsibilities of the engineering staff.

5. OTHER:

Includes those activities not found above such as educational leave, etc.

APPENDIX C DEFINITIONS

The following terms are defined for use in this study:

1. AGENCY - refers to the state, local or multijurisdictional air pollution control agencies. To qualify for inclusion in the report, all agencies must have had a specific budget and manpower complement working full-time and/or part-time in air pollution control activities.
 - a. STATE AGENCY - a single state agency designated by the governor of that state as the official state air pollution control agency. Washington, D.C., Puerto Rico and the Virgin Islands were included as state agencies.
 - b. LOCAL AGENCY - those agencies responsible for control activities within a specific political jurisdiction, i.e., county, municipality, etc., within their own state.
 - c. MULTIJURISDICTIONAL AGENCY - those agencies responsible for control activities within two or more political jurisdictions within the same state or within two or more states.
2. BUDGETED POSITIONS - all positions reported by the agencies, including FULL-TIME, PART-TIME AND VACANT which are included in an agency budget.
 - a. FULL-TIME POSITION - a position filled by an individual who devotes all of his work efforts toward air pollution control activities.
 - b. PART-TIME POSITION - a position filled by an individual who devotes less than 100% of his work effort to air pollution

control activities. This category also includes full-time employees of "environmental" agencies who devote a fraction of their work effort to air pollution control activities and the remainder to other activities, i.e., water pollution, solid waste, radiation control, etc.

- c. FILLED POSITIONS - includes both full-time and part-time positions, as in a and b above.
 - d. VACANT POSITION - a position authorized by the appropriate approving authority and for which funds have been allocated but is not filled on a full-time or part-time basis.
- 3. CLEAN AIR ACT - Clean Air Act (42 U.S.C. 1857 et seq.) includes the Clean Air Act of 1963 (P.L. 88-206), and amendments made by the "Motor Vehicle Air Pollution Control Act"--P.L. 89-272 (October 20, 1965), the "Clean Air Act Amendments of 1966"--P.L. 89-675 (October 15, 1966), the "Air Quality Act of 1967"--P.L. 90-148 (November 21, 1967), and the "Clean Air Amendments of 1970"--P.L. 91-604--(December 31, 1970).
 - 4. MANPOWER REPORT - Manpower and Training Needs for Air Pollution Control, Report of the Secretary of Health, Education, and Welfare to the Congress of the United States in Compliance with Public Law 90-148, The Air Quality Act of 1967.
 - 5. OBSTACLES - reasons reported by agencies regarding difficulties experienced or anticipated in filling vacant budgeted positions in agencies.
 - 6. PREDICTIVE MANPOWER MODEL - the model contained in Appendix A of the Manpower Report.

7. QUESTIONNAIRE - the document entitled "Manpower and Training Survey of State and Local Air Pollution Control Agencies" (OMD-85-R0148) used to collect data in this survey from air pollution control agencies. A copy of this document will be included in the final report scheduled for November 1971.
8. REGION - refers to the ten Environmental Protection Agency Regions defined as follows:

<u>Region</u>	<u>States Included</u>
I	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
II	New Jersey, New York, Puerto Rico, Virgin Islands
III	Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia
IV	Alabama, Florida, Georgia, Mississippi, Kentucky, North Carolina, South Carolina, Tennessee
V	Illinois, Indiana, Minnesota, Michigan, Ohio, Wisconsin
VI	Arkansas, Louisiana, New Mexico, Oklahoma, Texas
VII	Iowa, Kansas, Missouri, Nebraska
VIII	Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming
IX	Arizona, California, Hawaii, Nevada, Guam, American Samoa
X	Washington, Oregon, Idaho, Alaska