Task Analysis of State and
Local Air Pollution Control Agencies and
Development of Staffing Guidelines

VOLUME A
INTRODUCTION AND DIRECTIONS FOR USING THESE GUIDELINES (contained in Vols. B, C, D, E, F, and G)

ENVIRONMENTAL PROTECTION AGENCY
Manpower Development Staff Office of Air Programs
Research Triangle Park, North Carolina 27711

United States
Environmental Protection Agency
Contract No. 68-02-0306
Applied Science
Associates, Inc.

Task Analysis of State and Local Air Pollution Control Agencies and Development of Staffing Guidelines

---

VOLUME A 

Detailed Task Data, and Staffing Guidance
INTRODUCTION AND DIRECTIONS FOR USE
USING THESE GUIDELINES

K. I. Rifkin, Senior Staff Scientist, ASA
R. L. Dueker, Staff Scientist, ASA
W. F. Diggins, Staff Scientist, ASA
F. C. Foss, Staff Scientist, ASA
and
Michael Senew, Project Officer, USEPA

Prepared for the
United States Environmental Protection Agency
Manpower Development Staff
Office of Air Programs
Research Triangle Park, North Carolina 27711
November 1972

This is not an official policy and standards document. The opinions, findings, and conclusions are those of the authors and not necessarily those of the United States Environmental Protection Agency. Every attempt has been made to represent the present state of the art as well as subject areas still under evaluation. Any mention of products, or organizations, does not constitute endorsement by the United States Environmental Protection Agency.

INTRODUCTION

One of the pressing problems in the air pollution control effort at Federal, state, and local levels is planning manpower requirements and developing manpower resources. Questions are being asked such as, how many people are needed, what kind of past experience and education should they have, how should their jobs be structured, what do they need to know to do their jobs, what special abilities do they need, and what kind of training should they receive to do their jobs? These questions are becoming increasingly meaningful as the control effort broadens with the creation of more and more local agencies and as existing agencies increase the scope and depth of their programs. Adequate answers are required if progress is to continue toward the goal of clean air.

In order to begin to answer questions relevant to manpower planning and development, a data base describing the tasks to be performed by control agency personnel and the skills and knowledge they must have to perform those tasks effectively must be available. Guidance concerning the use of the data base in making staffing decisions must be prepared. It is the purpose of this study to provide such a data base and the appropriate guidance.

A. Objectives

The objectives of this project were the following:

1. To identify as great a proportion as possible of the population of tasks currently being performed by air pollution control agency personnel at the state and local level throughout the country.
2. To describe the identified tasks in terms of component behaviors and the skills and knowledge required to perform those behaviors.
3. To identify and describe categories of air pollution control agency personnel who would perform the tasks mentioned above.

continued

4. To structure and communicate the data which resulted from achieving the above objectives in a form which could be used by agency management in planning and developing manpower resources.

B. General Project Overview

The project was performed in two phases. Phase I dealt with achieving the first two project objectives, and resulted in the development of a detailed data base describing the major tasks performed by agency personnel in terms of the procedural components of the tasks and the skills and knowledge required to perform them. Phase II dealt with achieving the last two major objectives, and resulted in production of a guidance document which integrates and structures data developed in Phase I and presents it in a form designed to assist agency manpower developers.

THIS IS VOLUME A
Additional books available are:

VOLUME B: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Engineering

VOLUME C: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Field Enforcement

VOLUME D: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Laboratory Support

VOLUME E: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Air Monitoring and Meteorological Support

VOLUME F: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Source Testing

VOLUME G: Guidance and Supporting Information for Staffing and Training Decisions in an Air Pollution Control Agency - Agency Management, Program Development, and Public Information Support

AND

TECHNICAL REPORT:
Task Analysis of State and Local
Air Pollution Control Agencies, and
Development
of Staffing Guidelines

For complete sets, or individual titles, or the Technical Report please address your request to:

United States Environmental Protection Agency
Manpower Development Staff
Research Triangle Park, N. C. 27711

II.

Overview of the Project that Produced this Document

The material presented here is the result of a ten-month project sponsored by the Office of Manpower Development (Planning and Special Projects Branch) of the Office of Air Programs, Environmental Protection Agency (EPA)[1]. The overall objectives of the project were the following:

1. To identify as great a proportion as possible of the tasks currently being performed by air pollution control agency personnel at the state and local level throughout the country.
2. To describe the manner in which the identified tasks are typically performed, and the skills and knowledge required to perform the tasks effectively.
3. To define categories of individuals who could efficiently learn to perform the identified tasks with the appropriate training.
4. To develop guidelines for state and local agencies which would assist them in selecting and training new personnel or in reassigning and training personnel already on their staffs.

A detailed description of the procedures, rationales, and concepts used in the project have been presented elsewhere in a separate technical report available from EPA.[2]

---

[1] The project was conducted by Applied Science Associates, Inc., Valencia, Pennsylvania, pursuant to Contract No. 68-02-0306 with the Environmental Protection Agency.

[2] "Task Analysis of State and Local Air Pollution Control Agencies and Development of Staffing Guidelines - Technical Report." To be published by the Manpower Development Staff, Office of Air Quality Planning and Standards, Environmental Protection Agency, Research Triangle Park, N. C. 27711

Briefly, the project consisted of the following phases:

A. Phase I: Identification and Description of Air Pollution Control Tasks

The basic approach taken to identify and initially describe the tasks performed at control agencies was to interview agency personnel at selected agencies and have them describe their jobs in detail. The control agencies selected to visit and the people to interview were chosen to maximize the likelihood that:

1. Coverage of tasks would be comprehensive and the skills and knowledge identified would be applicable to both large comprehensive and smaller non-comprehensive agencies (the latter by inclusion).
2. Task performers interviewed would be relatively proficient in their work such that the resulting task descriptions would reveal a thorough and effective means of performing the task.
3. The tasks described would be representative of those performed in state and local agencies across the country.

In all, 200 agency personnel were interviewed in the following nine comprehensive state and local agencies:

1. Allegheny County (Pennsylvania) Bureau of Air Pollution Control
2. Commonwealth of Pennsylvania Bureau of Air Pollution Control
3. City of Chicago Department of Environmental Control
4. New Jersey State Bureau of Air Pollution Control
5. Wayne County (Michigan) Air Pollution Control Division
6. State of Michigan Air Pollution Control Section
7. California Air Resources Board
8. Los Angeles County Air Pollution Control District
9. Puget Sound Air Pollution Control Agency (State of Washington)

It should be noted that the above agencies were not selected as the "most" thorough, comprehensive, or effective agencies in the country. They were selected because they were judged to be relatively proficient in several of the task areas; as a group they complemented one another in terms of effective task areas, such that the combination provided the study with ample and efficient coverage of most areas of agency activity; and they

included a variety of geographic areas, topographical and meteorological conditions, and pollution problems.

After identifying and describing the tasks performed in state and local control agencies, the project staff analyzed the task descriptions to identify the skills and knowledge required to perform each task effectively. Skills were defined as behaviors with unique requirements for speed and accuracy such that they typically must be learned and practiced before they can be performed adequately. Knowledge was defined as the information required by the task performer to successfully complete the task. This information usually includes task procedures; resource data; and special knowledge such as equipment nomenclature, technical jargon, and hazards to be avoided. Task information can be made available through a number of media, including books, tape recordings, and conversation.

The result of this portion of the study was a collection of task information which described the major tasks performed by control agency personnel and which identified the skills and knowledge required of the personnel to perform each task effectively.

B. Phase II: Development of Staffing Guidance

The second phase of the project was aimed at organizing and amplifying the task information described in Phase I. The goal was to develop an information system which could be used by agency planners to help them make decisions in the areas of staffing and training. The major issues the system would address would be:

1. Determing the type of individual to hire to perform a specific agency task or activity and identifying the content of the training that person would require to adequately perform the task.

2. Identifying the tasks to which current agency personnel could be assigned and determining the training content they would require for the new assignment.

In preparing the guidance materials twelve general "Occupational Categories" were developed. Each category describes the type of individual who, with the appropriate training, could effectively perform one or more of a group of identified agency tasks. Together, the twelve categories encompass a complement

of personnel capable of learning to perform all of the tasks described in Phase I. These Occupational Categories are described in further detail later in this volume.

The final effort of the project was to organize the task descriptive data, Occupational Category Descriptions, and staffing guidance into a format that would assist agency managers in selecting, assigning, and training their people. This volume and the six accompanying volumes comprise the integrated product of the two phases of the project.

III.

Overview of the Types of Information Provided for Staffing and Training Decisions

The information which has been developed and presented here to assist in solving staffing and training problems consists of detailed descriptions of tasks typically performed in a comprehensive air pollution control agency, including staffing guidance relevant to each task; and descriptions of categories of personnel, members of which are suited to learn to perform specific agency tasks.

A. Task Data and Staffing Guidance

The major portion of this document is the descriptive data and staffing guidance provided for all of the tasks identified in the study. The information has been organized into six separate volumes of data which accompany this introductory volume. Each data volume contains detailed descriptions for each of a related set of agency tasks. These Task Data and Staffing Guidance volumes are entitled:

Volume B: Engineering
Volume C: Field Enforcement
Volume D: Laboratory Support
Volume E: Air Monitoring and Meteorological Support
Volume F: Source Testing
Volume G: Agency Management, Program Development, and Public Information Support

Each task description in the data volumes is formatted to provide the following information concerning the task:

1. Task Overview. A general overview of the activities included in the task covered and any special directions for interpreting and using the information included.

2. Occupational Category. The category of agency personnel suggested to perform the task. If a senior member of the category is recommended, that is clearly indicated.

3. Task Description. A detailed description of the manner in which the task is typically performed.

4. Skill Requirements. A list of the skills required to effectively perform the task.

5. Knowledge Requirements. A list of the knowledge required to perform the task.

6. References. A list of source materials which provide some of the information required for the performance of the task.

7. Special Staffing Guidance. This section of the information provided for most tasks contains additional staffing information specific to the task being described. The kind of information presented varies from task to task and includes:

    a. The level of individual required within the suggested Occupational Category and the justification for the assignment. Whenever a senior level individual is required, that fact is mentioned and a rationale for requiring such a person is offered.

    b. Special training emphasis required for the task (e.g., emphasis on communication skills for a task involving dealing with the public).

    c. Suggestions regarding the appropriate Occupational Category for individuals who supervise the task performer or who assist the task performer with the relatively routine or complex portions of the task, when such a need exists.

B. Occupational Category Descriptions

The other major elements of information presented in this document are descriptions of the Occupational Categories. As mentioned above, one or more Occupational Category is suggested for each task described in the data volumes. The following twelve Occupational Categories were developed for this study:

Engineer
Engineering Technician
Chemist
Chemical Laboratory Technician
Meteorologist
Meteorological Technician
Field Enforcement Officer
Public Information Specialist
Air Pollution Control Director
Equipment Technician
Resources Administrator
Program Planning and Development Specialist

The Appendix to this volume contains detailed descriptions of each of the above categories of air pollution control agency personnel. It is felt that these categories account for most of the major functional areas of a control agency endeavor (excluding clerical activities). Each Occupational Category Description (OCD) characterizes the type of individual who, if provided the appropriate training or specialized education, could effectively perform a group of related tasks in the agency. The tasks are related in the sense that they require similar basic educational background and involve similar skill and knowledge requirements. These Occupational Categories were not designed to match any particular local merit system or civil service job specifications. However, the categories should be relatable generally across all such personnel description systems although the specific titles used are likely to vary from system to system.

Each OCD appended to this volume contains the following information about individuals in the category:

1. Category Title. Whenever the category is referred to throughout the guide and data volumes, the title is used (e.g., Engineer, Engineering Technician).

2. General Duties. This segment of an OCD describes the suggested role of personnel in that category within agency activities. Major functional areas of agency activity in which such individuals participate are identified and their tasks described generally.

3. Representative Assignments. This portion of the OCD presents a list of specific tasks to which members of the category may be assigned. The list includes tasks which are described in detail in the task data volumes. The list is meant to be representative, rather than exhaustive.

4. Representative Skill and Knowledge Qualifications. These are the general skills and knowledge which a member of the category should have to serve as a basis for acquiring the specific skills and knowledge necessary for the tasks to which he will be assigned.

5. Minimum Acceptable Educational Background. This section of the OCD states the minimum acceptable level of formal education suggested for efficient learning to perform the tasks to which members of the category may be assigned. In all cases this suggested level will have to be augmented with training or education to supply the specific skills and knowledge required to perform the assigned tasks.

Finally, with regard to level within a category, each OCD applies to both senior and junior members of the category. Senior members of an Occupational Category are individuals who have broadened and deepened their abilities through comprehensive experience on the job. As such, they could be called on to perform the suggested tasks under conditions in which increased abilities are required, including:

1. The suggested task must be performed under unusually stringent time limits.
2. Training, supervision, or job planning is required.
3. Unusual contingencies are anticipated.
4. Extensive public exposure or external pressure is anticipated.

IV.

Directions for Use of the Task and Staffing Data

The information provided in this volume and the six accompanying data volumes may be used to help solve staffing problems, including:

1. Determining the type of individual to hire to perform a specific task and the skills and knowledge needed to perform the task effectively.
2. Identifying the tasks to which a current staff member may be assigned and the skills and knowledge needed to perform the assigned tasks effectively.

Although this section will deal only with the above problems, it should be noted that the information presented in the data volumes is also useful for formalizing procedures for tasks within the agency, for identifying new task areas which the agency may wish to enter, for developing detailed job descriptions, and for establishing organizational relationships such as identifying which individuals should supervise others in performing a task and which individuals can assist others with routine, standardized assignments. These additional uses will be apparent to the reader after he has used the task descriptions and staffing data several times for their primary purposes and has become familiar with the materials.

A. Selection and Training of New Personnel for a Specific Task Assignment

A key question that must be answered in selecting and training an individual to perform a task is, "What does he need to know and be able to do in order to effectively perform the task on the job?" Once these needs are known they can be satisfied in one of two ways. An individual can be hired who has all of the required skills and knowledge, or an individual can be selected who has some of the requisite capabilities and can acquire the remainder with formal or on-the-job type training. The data volumes (B through G) accompanying this volume identify the skills and knowledge required to perform most tasks in an air pollution control agency. Also, all tasks in the data volumes have one or more suggested Occupational

Categories which indicate the minimum level and type of individual who should be selected and then trained to perform them. Under most conditions, an individual with all the required abilities will either be unavailable or too costly to obtain. Therefore, the skill and knowledge requirements listed for a task define the level of capability required for its performance, and the Occupational Category suggested for the task indicates an appropriate starting point for satisfying those requirements. In selecting an individual, a trade-off will have to be made between the cost of the individual and the degree of further training needed to reach the desired level of ability.

The following procedure, using the data and concepts described earlier, will support effective selection and training decisions.

1. Use Table 1 to locate within the data volumes the desired task or tasks to be performed. The page designation indicates where detailed descriptive information about the task can be found. The page designation consists of a letter and a number. The letter refers to the appropriate data volume, and the number to the page number in the volume on which the task data can be located. To confirm that the task title actually refers to the desired task, turn to the appropriate task data for a detailed description.

2. Check the matrix or the task data itself to identify the basic Occupational Category suggested for the task in question. The task descriptive information indicates the suggested Occupational Category for the task of concern. The section at the end of the task descriptive information labeled "Special Staffing Guidance" offers additional information relevant to the suggested task assignee (e.g., the specialized past experience he should have, whether or not a senior member of the prescribed category is required).

3. Refer in the Appendix of this volume to the detailed OCD for the suggested Occupational Category. This description should be adequate enough to identify the basic type of individual required to do the task. The required skills and knowledge listed for the desired task plus the basic abilities of individuals in the suggested category define the type of person needed to perform the task.

Advanced training or education beyond the minimum described in the OCD is required in almost all cases. The content of that education or training will vary as a function of the assigned tasks, and should provide all the skills and knowledge required to perform the task. The available sources for

Table 1

Matrix of Occupational Categories, Task Titles, and Page Numbers for Task Data and Staffing Guidance

Task Title	Vol.-Page	Occupational Categories											
		Air Pollution Control Director	Engineer	Engineering Technician	Field Enforcement Officer	Chemist	Chemical Laboratory Technician	Resources Administrator	Program Plan. & Development Specialist	Meteorologist	Meteorological Technician	Equipment Technician	Public Information Specialist
ENGINEERING:*													
Development and Production of an Emission Inventory	B-3		X										
Reception & Prelim. Screening of Plan Review/ Permit System Applictns. & Supporting Mtrls.	B-26			X									
Review of Plans and Application Forms in a Plan Review/Permit System	B-30		X										
Engineering Inspection	B-59		X										
Design and Construction of an Episode Control System	B-86		X										
Review of Application for Tax Exemption on Air Pollution Control Equipment	B-110		X	X									
FIELD ENFORCEMENT:													
Routine Inspection	C-3				X								
Complaint Investigation	C-21				X								
Patrol/Assigned Areas or Routes & Citation of Violators of Air Pollution Control Regulations	C-32				X								
Assist the Legal Staff in Preparation of Enforcement Actions	C-38				X								
Serving as a Witness in Court or at a Hearing	C-45	X	X		X	X		X		X			
Organization and Operation of a Smokeschool	C-48				X								
LABORATORY SUPPORT:													
Determination of Nitrogen Dioxide and Nitric Oxide Concentrations in the Atmosphere Using the Saltzman Method	D-4						X						
Determination of Sulfur Dioxide Concentration in the Atmosphere Using the West-Gaeke Method	D-9						X						
Determination of Sulfur Dioxide and Sulfur Trioxide Concentrations in Stack Gases	D-14						X						
Determination of Suspended Particulate Concentration in the Atmosphere by Means of High Volume Sampling	D-18						X						
Determination of Hydrogen Sulfide Concentration in the Atmosphere Using the Methylene Blue Method	D-21						X						
Determination of Nitrate Concentration in Suspended Atmospheric Particulates Using the 2, 4 Xylenol Method	D-27						X						
Determination of Sulfate Concentration in Suspended Atmospheric Particulates Using the Turbidimetric Barium Sulfate Method	D-32						X						
Determination of Metal Concentration in Suspended Atmospheric Particulates by Means of High Volume Sampling	D-37						X					X	
Determination of Particulate Concentration in Stack Emissions	D-42						X						
Identification of the Constituents of Dust Particles	D-47						X					X	
Maintenance of Laboratory Devices	D-52											X	
Supervision of Laboratory Support Tasks	D-56					X							
Development of New Methods for the Analysis of Air Pollutants	D-65					X							

*Additional engineering tasks, identified in the study but not analyzed in detail, are listed in Table B-1, page B-113, Vol. B.

Table 1 (Continued)

Task Title	Vol.-Page	Occupational Categories											
		Air Pollution Control Director	Engineer	Engineering Technician	Field Enforcement Officer	Chemist	Chemical Laboratory Technician	Resources Administrator	Program Plan. & Development Specialist	Meteorologist	Meteorological Technician	Equipment Technician	Public Information Specialist
AIR MONITORING & METEOROLOGY SUPPORT:													
Operation/Maintenance Flame Ionization Hydrocarbon Analyzer	E-4											X	
Operation/Maintenance Infrared Analyzer	E-10											X	
Operation/Maintenance Coulometric Titration Analyzers for SO_2, NO, NO_2, or Oxidants	E-15											X	
Operation/Maintenance Gas Chromatograph Analyzer Programmer	E-24											X	
Operation/Maintenance Gas Chromatograph Anlyzr.	E-29											X	
Operation/Maintenance Colorimetric Air Monitoring System	E-37											X	
Operation/Maintenance Sequential Sampler	E-42											X	
Operation/Maintenance High Vol. Air Sampler	E-46											X	
Operation/Maintenance A.I.S.I. Auto. Sampler	E-49											X	
Operation/Maintenance Wind Speed Transmitter	E-53											X	
Operation/Maintenance Wind Direction Transmttr.	E-58											X	
Supervision Air Mon. Equipment O/M Tasks	E-64					X							
Use of the Smog Chamber as a Tool in Photochemical Smog Research	E-70											X	
Design of an Air Monitoring Facility	E-78					X							
Routine Forecast of Meteorological Conditions and Pollution Levels or Effects	E-90									X			
Assemble Meteorological Data and Describe Climatological Conditions	E-96										X		
Problem Solving Using Mathematical Models	E-100									X			
SOURCE TESTING:													
Performance of a Stack Test	F-3											X	
Managing a Stack Test	F-10		X										
Determination of Odor Concentrations in the Atmosphere or in Stack Emissions	F-19											X	
Performing a Used Car Inspection	F-23											X	
Performing the Idle and ACID Tests	F-27											X	
Planning the Dynamometer Installation	F-30		X										
Operation/Maintenance Engine Dynamometer	F-35											X	
Operation/Maintenance Chassis Dynamometer	F-42											X	
AGENCY MGMT., PROGRAM DEVELOP., & PUBLIC INFOR.:													
High Level Agency Management	G-3	X											
Agency Ressources Management	G-25							X	X				
Technical Management	G-35		X		X	X				X			
Literature Review & Data Summary Regarding Ambient Air Quality Standards	G-52								X				
Development of New or Modified Regulations	G-63								X				
Support of Develop. Local Control Programs	G-75								X				
Preparation Public Information Presentation	G-86												X

required education or training include:

1. Graduate School Programs (Masters and Ph.D. programs in Air Pollution areas)
2. University Undergraduate Programs (degree or non-degree programs)
3. Junior College (2-year) Technical Programs
4. EPA Institute for Air Pollution Training Courses
5. Air Pollution Control Association Professional Development Programs
6. American Institute of Chemical Engineers Continuing Education Programs
7. State-sponsored training courses (e.g., New York State Air Resources Training Program)
8. On-the-job training administered by the agency
9. Courses offered by manufacturers of air pollution control equipment and related instruments

The OCD does not specify the exact type of advanced training required for a task because of the broad diversity of programs and courses available. However, the individual selected should be a member of the prescribed category and must ultimately (by one means or another) acquire all of the skills and knowledge identified in the data volume for the desired task.

4. Identify the personnel category in the local merit or civil service system most similar to the suggested Occupational Category and level. If the local personnel system contains more than one category which is similar to the suggested category, the skill and knowledge requirements associated with the task in question should permit identifying the appropriate category. The category of the desired individual (defined using the local personnel system) should now be known.

5. To determine the advanced education or training the individual selected to perform the task will require, identify which of the skills and knowledge required to perform the task he already possesses. This judgment will have to be made by reviewing and assessing the individual's experience. Any required skills and knowledge not already possessed will

have to be acquired using one of the sources listed above. Depending upon the task to be performed it may be advisable to required the selected individual to have acquired the advanced training prior to joining the staff (e.g., a Master's Degree or a two-year Associate's Degree).

6. Review the relevant Special Staffing Guidance for any further information regarding selection of an individual for the task.

B. Assigning Tasks to Current Agency Personnel.

Assigning current agency personnel to specific tasks is another problem of matching the capabilities of an individual to those required to perform the required task. The method suggested here is to identify the abilities of the individual and then select a task which he is currently capable of performing or for which he can be trained. The following procedure is recommended to make use of the information provided in the data volumes.

1. Using the Occupational Category Descriptions appended to this volume, identify the category which best matches the individual for whom the new assignment is desired. Ideally, the match should be as complete as possible in terms of the following factors:

a. The individual's current role should be similar to the one described in the OCD under "General Duties." If it is not, judge whether or not the individual is capable of playing such a role. Is he overqualified?

b. The individual currently should perform one or more of the representative assignments listed in the OCD.

c. The individual currently possesses the abilities listed under "Representative Skills and Knowledge."

d. The individual's educational background satisfies the minimum acceptable level suggested.

2. Enter Table 1 and identify all of the tasks suggested for the Occupational Category which seem to best fit the individual in question. Select a task, locate it in the data volume, and review the detailed description and staffing guidance. The decision as to whether or not the task should be performed within the agency is a decision beyond the scope of this document and must be made by agency management.

3. To determine the training the current staff member will need for the new assignment, identify which of the skills and knowledge required

for the task the individual does not already possess. This judgment will have to be made by reviewing the skills and knowledge the individual currently displays at an adequate level in the tasks he now performs. All of the skills and knowledge required for the new assignment which are not already in the individual's possession will have to be acquired through formal or on-the-job type training.

4. Review the relevant Special Staffing Guidance for any further information concerning the assignment.

C. Factors to Keep in Mind While Using this Document

In order to get the most value from the data provided in this document, some further points should be understood concerning its uses and limitations.

1. The units of agency activity described in the data volumes are tasks or closely related groups of tasks, rather than jobs. A job can consist of a portion of a task, a complete task, or several tasks. The amount of work comprising a job depends upon the agency's work load and other factors not considered in this study. Therefore, the staffing and training guidance provided in this document relates to the specific tasks identified in the study, and the development of jobs is left to agency management to carry out in response to their own needs and limitations.

However, a rule of thumb can be offered for developing jobs from the information presented in this document. To form a job from one or more tasks presented here, be sure to select only tasks requiring the same Occupational Category and generally similar skill and knowledge requirements. For example, do not form a job by combining a task requiring an Engineer with a task requiring an Engineering Technician. The job will have to be performed by an Engineer with part of his time devoted to activities significantly below his capabilities.

2. The task information presented in the data volumes does not cover all possible agency tasks. It does cover a high proportion of the professional and technical activities of the agency. The tasks which were not covered include:

a. Statistical analysis/data processing

b. Computer programming and operation

c. Biological and agricultural research and analysis relevant to air pollution control problems

d. Consideration of economic or fiscal factors in air pollution control programs

3. In describing some agency tasks (e.g., operation and maintenance of air monitoring equipment, and laboratory analysis of air samples) specific equipment and procedures were studied as examples of the manner in which such tasks are performed. The task data reported is judged to representative of the type of task covered, and the specific equipment or procedures analyzed should not be viewed as superior to others as recommended hardware or techniques to employ.

D. A Final Note on the Criteria Used for Assigning Occupational Categories to Agency Tasks

As a result of the detailed study of agency tasks, it was clear that some tasks would be more efficiently learned and effectively performed by college-trained people. In the project staff's opinion, tasks demanding a college level individual are those with the following characteristics:

1. Tasks which are typically unproceduralized. Unproceduralized tasks have the following characteristics:

    a. They are not standardized in terms of how they are to be performed; complete, detailed instructions for them are not available; and creativity and ability to meet a wide variety of unpredictable contingencies are required to perform them. Evaluation of plans in a permit processing system is an unproceduralized task. On the other hand, inspection of a private residence incinerator is an example of a relatively proceduralized task.

    b. They demand broad-based conceptual level knowledge in order to make decisions or solve problems.

    c. They require heavy emphasis on judgment rather than concrete rules.

2. Tasks which require credibility in order to be effectively performed. The term "credibility" as used in this context refers to the extent to which a college degree as a "credential" is expected by the agency's constituency (e.g., the general public, industry, citizen groups, lawmakers). For certain tasks in the agency a degree greatly enhances the individual's ability to perform his function, for example: negotiating a compliance program with representatives of an industry; addressing legislators regarding new regulations; forecasting pollution conditions which legally limit industrial activity. To be maximally effective an individual performing such tasks must be accepted as an authority in his field, and in our society a formal education is a minimum, however critical, requirement for such acceptance.

The above criteria were used in assigning Occupational Categories to tasks. As a result, it is felt that the suggested assignments represent an efficient trade-off of selection and training costs without hampering the agency's capability to effectively achieve its objectives.

APPENDIX

Occupational Category Description

ENGINEER

General Duties

Personnel in this category are responsible for tasks which generally require engineering analysis and evaluation of basic and control equipment used in industrial, commercial, and public sectors. The primary areas of agency activity in which engineers play a major role include:

1. Plan review/permit processing
2. Emission inventory
3. Episode control
4. On-site equipment examination
5. Compliance program development and management
6. Special studies (e.g., evaluation of new control techniques or equipment).
7. Source testing
8. Regulation development.
9. Design, construction and deployment of air surveillance systems.
10. Design of monitoring systems.

The duties of Engineers typically involve detailed analysis and evaluation of the effectiveness of proposed and existing air pollution control equipment and determination of the potential emissions of controlled or uncontrolled basic equipment in a wide variety of processes. Engineers are responsible for evaluating the feasibility and effectiveness of proposed means for curtailing emissions during periods of adverse meteorological conditions and for convincing managers of sources to accept reasonable and effective curtailment methods. The predominate characteristic of the Engineer's activities is the need to solve a broad variety of multi-disciplinary engineering problems under conditions of minimum structure, a high contingency probability, and close public scrutiny.

Representative Assignments

1. Review application forms, plans, and design data in order to evaluate the acceptability of proposed basic equipment or control devices.

2. Perform detailed inspections of basic or control equipment installations with regard to plan review requirements (e.g., to assure that equipment installed under a permit meets the conditions of the permit).

3. Develop specific compliance programs for particular sources and monitor their progress in meeting the requirements of the program.

4. Analyze industrial processes to identify operations with pollution potential and use emission estimation procedures to develop an emission inventory.

5. Evaluate source curtailment plans submitted by industrial/commercial facilities in response to episode control system requirements.

6. Provide engineering assistance (as required) to agency personnel and public and private sectors relevant to air pollution control technology. For example, serve on zoning commissions, provide technical data to agency enforcement personnel in a complaint investigation, or lecture citizen groups on local air pollution control efforts and control technology.

7. Appear in court or at hearings as an expert technical witness in actions such as variance proceedings, enforcement actions, and in support of the agency's position on new or modified regulations.

8. Maintain direct contact with industry and commerce, and represent the agency in its control and regulatory efforts.

Representative Skill and Knowledge Qualifications

1. Ability to communicate in written and spoken form to a variety of types of audiences (both technical and non-technical).

2. Ability to apply general, systematic problem-solving techniques to conceptual and technical problems.

3. Ability to use data manipulation aids including desk calculators, slide rule, nomographs, data tables, and graphs.

4. Ability to prepare, read, and interpret engineering drawings, plans, or technical specifications.

5. Ability to apply basic engineering skills and knowledge to the analysis and evaluation of basic and control equipment used in industrial, commercial, and public facilities.

6. Basic knowledge of industrial processes, equipment, and practices which are relevant to air pollution control.

7. Knowledge of basic engineering principles, analytic procedures, and applied techniques (including mathematical, statistical, or chemical data manipulation methods).

8. Knowledge of engineering resource materials.

9. Ability to get along with people.

Minimum Acceptable Educational Background

Bachelor's Degree with a major in engineering. Advanced education or training will be required to provide the skills and knowledge necessary to perform specific tasks to which the individual is assigned.

Occupational Category Description

ENGINEERING TECHNICIAN

General Duties

Personnel in this category perform relatively routine and proceduralized tasks in support of the agency's engineering function. Their role is generally assisting Engineers in areas including:

1. Plan review/permit processing
2. Emission inventory
3. Episode control
4. On-site equipment examination
5. Compliance program development and management
6. Special studies (e.g., evaluation of new techniques or equipment for air pollution control)

The tasks performed by an Engineering Technician typically involve collection of data or information, relatively standardized data analysis and manipulation, straight forward calculations which can be easily proceduralized, basic screening of equipment designs, uncomplicated equipment inspections, and routine communications with the agency constituency regarding engineering functions.

Representative Assignments

1. Receive and make preliminary check on the completeness of permit applications and supporting descriptive materials.
2. Calculate plan review/permit processing fees (if an adequately proceduralized routine exists).
3. Perform proceduralized emission estimation calculations.
4. Coordinate emission inventory data collection mailings, and record input data as it comes in.
5. Make routine check of ambient air and meteorological conditions and detect when critical values are reached (with regard to episode control procedures).

6. Prepare data collection formats for emission inventory or episode control programs after the data requirements and method of collection have been identified.

7. Review applications for tax exemptions on air pollution control equipment which has been granted a permit to operate.

8. Routine recordkeeping of progress reported in compliance programs for specific industries or facilities.

Representative Skill and Knowledge Qualifications

1. Ability to accurately perform arithmetic calculations and perform algebraic manipulations.

2. Ability to use a desk calculator and use nomographs, data tables, and other aids to data manipulation.

3. General ability to read and interpret basic engineering drawings and industrial process flow charts.

4. Ability to work with people effectively and to communicate effectively in spoken and written form.

5. Ability to follow procedures, being careful to accurately perform all required steps.

6. General knowledge of the basic equipment, practices, and operations used in industrial and commercial processes, including:

    a. Metal melting

    b. Dry material handling (e.g., cement batching)

    c. Dry cleaning

    d. Surface coating

    e. Incineration

    f. Combustion (e.g., power generation)

    g. Storage vessels (e.g., open top tanks)

Minimum Acceptable Educational Background

High school diploma (or equivalent) with course work in mathematics (through algebra and basic analytic geometry) and physical science (e.g., chemistry

and physics). This formal education will have to be augmented with technical training to provide the skills and knowledge required for the specific tasks to which the individual is assigned.

Occupational Category Description

CHEMIST

General Duties

Personnel in this category generally perform supervisory roles in a chemical laboratory operation supporting the agency's air monitoring and source testing efforts. In addition, Chemists are involved in the design of air monitoring systems and in the development of new laboratory procedures, techniques, and equipment.

Representative Assignments

1. Supervise Chemical Laboratory Technicians performing standard analyses procedures.
2. Develop new methods for the analysis of air pollutants.
3. Supervise Equipment Technicians involved in maintenance of laboratory equipment.
4. Design air monitoring facilities and systems. This task may be performed cooperatively with Engineers or agency planning personnel.
5. Design, supervise, and report scientific or applied research (e.g., evaluation of the effectiveness of new analysis techniques or instruments).

Representative Skill and Knowledge Qualifications

1. Ability to communicate effectively in written and spoken form.
2. Ability to apply general, systematic problem-solving techniques to conceptual and technical problems.
3. Detailed knowledge of chemical and physical techniques, procedures, concepts, and equipment relevant to analysis of pollutant concentrations.
4. Basic knowledge of general industrial processes and chemical and physical nature of their effluents.

5. Knowledge of basic scientific and technical resource literature available which is relevant to the analyses commonly performed in agency laboratories.

6. Knowledge of the hazards to be observed in performing analyses in the chemical laboratory.

7. Detailed knowledge of the scientific method and of research design principles.

8. Detailed knowledge of the procedures and techniques for use of standard laboratory devices.

9. Knowledge of proper analytic procedures for obtaining valid results. This knowledge should be sufficient to:

    a. Identify errors possible in each step of the procedure and their effect on the final outcome of the analysis.

    b. Identify critical steps in the procedure. A critical step is one in which

        (1) Errors are known to frequently occur

        (2) Little margin for error exists

        (3) Errors are likely to go undetected

    c. Revise procedures so as to reduce the possibility of error.

10. Knowledge of the chemical, electrical, and mechanical principles of operation of the various analysis instruments sufficient to:

    a. Identify instrument malfunctions which could go undetected and result in inaccurate read-out (to the extent not already documented in existing service manuals).

    b. Develop procedures for the timely discovery of such malfunctions.

    c. Identify the effects of incorrect instrument operation on instrument read-out.

Minimum Acceptable Educational Background

Bachelor's Degree in chemistry. Advanced education or training will be required to provide the skills and knowledge necessary to perform specific tasks to which the individual is assigned.

Occupational Category Description

CHEMICAL LABORATORY TECHNICIAN

General Duties

The Chemical Laboratory Technician performs proceduralized, standard wet test chemical analyses of atmospheric pollutants in a laboratory setting under close supervision of a Chemist.

The tasks performed by the Chemical Laboratory Technician typically involve the following general activities:

1. Preparing, labeling, standardizing, and storing reagents; maintaining a record of their ages; and disposing of them when their recommended shelf life has been exceeded.
2. Distilling water required for chemical analyses.
3. Cleaning and assembling apparatus.
4. Conducting analyses according to detailed step-by-step directions, receiving assistance from a Chemist as required.
5. Recording the results of the analysis in a standard form (including deviations from the standard procedure).
6. Calculating pollutant concentration using detailed step-by-step directions.
7. Reporting all calculations in standard form to a Chemist.
8. Disassembling, cleaning, and storing all apparatus.

Representative Assignments

The following tasks are representative of the type of tasks the Chemical Laboratory Technician could perform with appropriate supervision:

1. Determination of Nitrogen Dioxide and Nitric Oxide Concentrations in the Atmosphere Using the Saltzman Method.

2. Determination of Sulfur Dioxide Concentration in the Atmosphere Using the West-Gaeke Method.

3. Determination of Sulfur Dioxide and Sulfur Trioxide Concentrations in Stack Gases.

Representative Skill and Knowledge Qualifications

1. Ability to perform basic laboratory operations typically required for the type of chemical analysis procedures performed by the Chemical Laboratory Technician. Such operations include:

   a. Preparing reagents and handling caustic or otherwise dangerous chemicals without splattering acid, precipitating an explosion, or otherwise damaging personnel or equipment.

   b. Obtaining definite volumes of solutions using apparatus such as a pipette, syringe, volumetric flask, or burette.

   c. Using an analytical balance to obtain an accurate weight of a dry reagent or filter.

   d. Cleaning glassware and other apparatus without breakage or injury to oneself.

   e. Performing a quantitative transfer of a solution from one container to another without losing any of the sample.

   f. Cleaning grease from the neck of a flask without contaminating the contained sample with the cleaning agent.

2. Ability to read indicating devices, such as a thermometer, manometer, dry gas meter, and flowmeter, and to interpret meter readings.

3. Ability to follow directions for assembling sampling apparatus with each component in proper sequence.

4. Ability to read and interpret data from tables, psychometric charts, or nomographs.

5. Ability to perform arithmetic calculations and resolve algebraic equations in four variables, using detailed step-by-step procedures.

6. Ability to accurately and completely follow procedures and directions.

7. Knowledge of general damages and hazards common to work in a chemical laboratory.

8. Basic knowledge of chemical concepts and nomenclature (e.g., metric units, reagents, common laboratory glassware).

Minimum Acceptable Educational Background

High school diploma (or equivalent) with courses in chemistry and algebra. This formal education will have to be augmented with technical training to provide the skills and knowledge required for the specific tasks to which the individual is assigned.

Occupational Category Description

METEOROLOGIST

General Duties

Personnel in this category are responsible for tasks which require analysis or prediction of meteorological conditions and their effects on concentrations, distribution, and diffusion of air contaminants. The primary areas of agency activity in which Meteorologists function include:

1. Air monitoring
2. Episode control
3. Plan review (in predicting emission concentrations at ground level as a function of meteorological conditions)
4. Daily forecasts or reports of pollution conditions
5. Research in pollution forecasting methods
6. Source testing
7. Modelling of pollution phenomena to solve large scale planning problems (e.g., source siting).
8. Direct support with current meteorological and climatological data to scientists and engineers in other sections of the control agency.

The duties of the Meteorologist involve detailed analysis, forecasting, and interpretation of meteorological factors and their impact on pollution conditions. The Meteorologist is also involved in developing new and improved methods for achieving his objectives. His tasks are characterized by high contingency probability, often inadequate technology for problem solution, and close public attention to his pronouncements.

Representative Assignments

1. Problem solving using mathematical models (e.g., diffusion models).
2. Routine forecasting of meteorological conditions and pollution level effects.
3. Purchasing and evaluating meteorological instruments.

4. Developing objective methods for predicting pollution conditions from known local emission characteristics, meteorological conditions, and other factors (e.g., topographical features).

5. Assisting in development of the episode control system.

6. Determining locations for air monitoring stations.

Representative Skill and Knowledge Qualifications

1. Ability to communicate effectively in written and spoken form.

2. Ability to apply systematic problem-solving techniques to the solution of conceptual and technical problems.

3. Detailed knowledge of National Weather Services services and products relevant to forecasting local meteorological conditions.

4. Knowledge of accepted meteorological forecasting procedures and techniques.

5. Knowledge of probability theory, statistical methods, and appropriate interpretation of statistical findings.

6. Basic knowledge of industrial processes; the chemical or physical properties of their effluents; and their interaction with atmospheric and meteorological conditions.

7. Basic knowledge of air pollution control technology and regulatory activities.

8. Knowledge of the state-of-the-art in areas including:

    a. Meteorological and air quality monitoring systems.

    b. Automatic data transmission, processing, and display equipment.

9. Knowledge of basic principles of use and interpretation of mathematical modeling methods and results.

Minimum Acceptable Educational Background

Bachelor's Degree in meteorology (with course work in mathematics or engineering). Advanced training or formal education may be required to provide the skills and knowledge necessary to perform specific tasks to which the individual is assigned.

Occupational Category Description

METEOROLOGICAL TECHNICIAN

General Duties

Individuals in this occupational category support the agency's Meteorologist by performing relatively proceduralized functions including:

1. Assembly or collection of meteorological data.
2. Manipulation or analysis of meteorological data.
3. Preparation of routine announcements of weather and pollution conditions.
4. Routine maintenance of meteorological instruments.
5. Preparation of findings for presentation in published reports.

In performing the above functions, the Meteorological Technician inputs directly to, and is supervised by, a Meteorologist. The tasks performed by a Meteorological Technician typically involve collection of data or information, relatively standardized data analysis and manipulation, straightforward calculations which can be easily proceduralized, basic monitoring of meteorological and ambient air equipment, and communications with the public and news media to report current conditions and forecasts.

Representative Assignments

1. Collect meteorological data from agency air monitoring stations.
2. Assemble meteorological data (e.g., from daily teletype printout), format it, and describe current or past climatological conditions (e.g., presence and strength of inversions).
3. Perform correlations and other standard statistical procedures in support of Meteorologists investigating the relationship of meteorological conditions and pollution.

4. Document routine public information statements which describe current or forecasted meteorological and pollution conditions (e.g., format relevant information and make it available to local news media).

5. Perform proceduralized, routine maintenance on meteorological monitoring equipment. This task can also be performed by the Equipment Technician.

6. Carry out proceduralized tasks required in performing and reporting research in the areas of meteorology and air pollution control, for example: preparation of data tables, graphs, wind roses, surface maps, etc., using data provided by the Meteorologist.

7. In a sufficiently proceduralized Episode Alert System, monitor ambient air or meteorological conditions for early signs of a developing episode.

8. In a sufficiently objective and proceduralized pollution condition forecasting system, predict basic pollution levels as a function of current or forecasted meteorological conditions or other factors (e.g., time of year).

Representative Skill and Knowledge Qualifications

1. Ability to accurately perform arithmetic calculations and algebraic manipulations.

2. Ability to use a desk calculator, nomographs, data tables, and other data manipulation aids.

3. Ability to accurately and completely follow procedures and directions.

4. Knowledge of the meteorological terminology and concepts used in air pollution control-related tasks and at a level of detail appropriate to the type of proceduralized tasks in which the Associate Meteorologist participates.

5. A basic knowledge of the relationship of air pollution contaminant levels to general meteorological conditions.

6. Knowledge of the basic principles of graphing data on two-or three-dimensional plotting systems and the ability to plot data neatly and accurately.

Minimum Acceptable Educational Background

High school diploma, with emphasis on science and mathematics (including algebra and analytic geometry). This formal education will have to be augmented with technical training to provide the skills and knowledge required for the specific tasks to which the individual is assigned.

Occupational Category Description

FIELD ENFORCEMENT OFFICER

General Duties

Personnel in this occupational category generally work to enforce agency control and regulatory efforts through inspecting and policing activities. In addition, they can perform a variety of administrative activities which support the direct field enforcement operation. The areas of the Field Enforcement Officer's activities include:

1. Routine inspections
2. Complaint handling and investigation
3. Surveillance and Patrol
4. Identification of violations and performance of appropriate enforcement procedures including investigation and documentation of violations.
5. Smokeschool administration
6. Assist agency legal staff

The role of the Field Enforcement Officer typically does not require a high level of technical expertise in areas of engineering, industrial process, or air pollution control equipment design and performance characteristics. Most of their operations are routine and usually standardized. However, members of this group have a great deal of contact with the public, and this element of their effort does not lend itself to proceduralization.

Representative Assignments

1. Perform routine and partially proceduralized inspection of small commercial or industrial facilities. Such inspections can be in support of:
   a. Complaint investigations.
   b. Enforcement of the agency's episode control system requirements.

c. Enforcement of the agency's permit system requirements

d. Annual boiler or incinerator inspection requirements

2. Patrol areas of the agency's jurisdiction looking for violations of the regulations relevant to mobile or stationary sources and documents violation.
3. Organize, prepare, and administer smoke-reading training for agency personnel.
4. Document complaints and pursue complaint investigations with the objective of identifying legitimate complaints and satisfying the complainant's requests.
5. Perform routine and proceduralized enforcement tasks, including reporting and serving violation notices and testifying as a witness in court as required.
6. Assist the agency legal staff in preparing proceduralized and routine documentation and evidence for use in legal actions.

Representative Skill and Knowledge Qualifications

1. Ability to effectively interact and communicate with complainants and the management of facilities to be inspected.
2. Ability to interpret regulations.
3. Ability to read basic engineering or process flow diagrams.
4. Ability to perform arithmetic computations.
5. Ability to evaluate smoke density.
6. Ability to follow procedures, being careful to accurately perform all required steps.
7. Basic knowledge of small to medium size industrial or commercial processes relevant to air pollution (e.g., paint spraying, dry cleaning, incineration, and fuel combustion equipment).
8. Basic knowledge of terminology used in air pollution control operations.

Minimum Acceptable Educational Background

High school diploma (or equivalent). This formal education will have to be augmented with technical training to provide the skills and knowledge required for the specific tasks to which the individual is assigned.

Occupational Category Description

PUBLIC INFORMATION SPECIALIST

General Duties

Personnel in this category implement the public information program and policies of the agency. Their role is to prepare public information presentations in various media and for a variety of audiences. Their work requires them to articulate technical, legal, scientific, and medical facts and concepts in a manner which is sensitive to the information needs of the audience and the objectives of the communication.

Representative Assignments

1. Prepare public information presentations.
2. Contribute to development of an agency public information policy.
3. Arrange public information events such as press conferences, television appearances for staff members, and publicity activities (e.g., exhibits or demonstrations).

Representative Skill and Knowledge Qualifications

1. Ability to design and write effective prose.
2. Ability to orally communicate effectively with individuals of widely divergent professional or technical interests.
3. Ability to quickly learn technical knowledge, legal requirements, and scientific findings relevant to the area of air pollution control.
4. Ability to research technical and scientific literature.
5. Knowledge of media andproduction areas relevant to development of a public information presentation.
6. Knowledge of the procedures for developing, maintaining, and utilizing contacts with personnel in mass media and other information dissemination positions.

Minimum Acceptable Educational Background

Bachelor's Degree with a major in areas such as journalism, literature, advertising, English, etc., with some background in physical science or engineering.

Occupational Category Description

AIR POLLUTION CONTROL DIRECTOR

General Duties

The Air Pollution Control Director is responsible for leadership of the agency's technical, administrative, and regulatory activities. As such, his activities can be generally characterized to include:

1. Collecting information required for guidance and development of agency efforts.
2. Making decisions concerning agency policy and objectives.
3. Coordinating and directing the planning and development of agency activities.
4. Coordinating, directing, and evaluating agency activities and progress.
5. Representing the agency in interactions with its constituency (public and private sectors) and with various governmental bodies.

Representative Assignments

1. Communicate with organized citizen groups to determine their goals and desires with regard to air pollution control and the extent to which they are satisfied by agency efforts.
2. Identify the expectations and performance criteria of governmental agencies (federal, state, or local) which provide funds or otherwise support agency activities.
3. Consult with attorneys and establish guidelines for the interpretation of specific local regulations.
4. Coordinate preparation of the agency's annual budget, evaluate it with regard to agency objectives, and defend it before a governmental funding agency. Provide liaison with controlling legislative bodies.

5. Direct development of the agency's position with regard to new or modified regulations.

6. Coordinate development of new techniques and materials required to implement proposed or newly promulgated regulations.

7. Routinely review and evaluate published materials depicting the state-of-the-art in technical and management areas (e.g., air pollution control technology, personnel management techniques, program planning and budgeting methods, latest legal interpretations and precedents).

8. Coordinate or direct agency personnel recruitment, training, and performance evaluation systems.

9. Negotiate with representatives of a major pollution source to work out a suitable compliance program (including equipment to be installed and an acceptable timetable).

10. Conduct press conferences with news media.

Representative Skill and Knowledge Qualifications

1. Ability to effectively chair public or private meetings intended to generate questions, comments, criticisms, or recommended modification to proposed regulations or activities.

2. Ability to communicate effectively in written or spoken form with representatives of industry, citizen groups, or politicians to accomplish functions including:

    a. Solicit criticisms, expectations, demands and supporting technical information relevant to development of new regulations or agency policy.

    b. "Sell" the agency's position on the proposed regulation.

    c. Negotiate a compromise version of the regulation which meets the requirements of the agency and satisfies the pressure groups.

    d. Promote and explain an episode control system.

    e. Aid in development of local control programs.

3. Ability to judge current local political or economic conditions and react to them accordingly in developing agency activities or policy.

4. Ability to systematically and effectively solve problems or make decisions. This general skill includes:

    a. Ability to accurately define the problem in terms of objective, desirable outcome.

    b. Ability to accurately and completely identify the elements of the situation which affect selection or development of a solution.

5. Ability to integrate knowledge of agency capability, past experience, local regulations, and knowledge of the state-of-the-art in air pollution control and regulatory technology to define and then seek to achieve agency objectives.

6. Ability to coordinate an on-going evaluation of local agency internal training, procedure development, and external activities (e.g., performance of control and regulatory efforts).

7. Ability to select enforcement actions which are appropriate for specific types of violations and circumstances. This skill may require the ability to interact with attorneys and enforcement personnel in selecting the appropriate enforcement action.

8. Ability to evaluate the quantity and quality of work produced by the staff and discriminate acceptable from unacceptable performance. This skill assumes the ability to develop or use criteria of performance acceptability.

9. Knowledge of the technical areas of air pollution control and industrial processes at a level of detail required for management activities, including:

    a. Development or approval of new regulations.

    b. Response to questions and criticism regarding agency activity from newsmen, the public, governmental bodies.

    c. Development or approval of specific compliance programs.

d. High level supervision of the agency's activities in technical, engineering, and enforcement areas.

e. Agency policy and program development.

10. Knowledge of the types of situations which can occur and which signal the need for developing new regulations or amending current regulations. Such conditions include:

a. A new Federal ambient air quality standard is promulgated for a specific contaminant.

b. Current emission standards are not achieving the desired effect on air quality.

c. A breakthrough in air pollution control technology has occurred which makes a new generation of emission standards achievable.

d. There has been an excessive number of single-chamber incinerator smoke violations.

e. Scientific evidence has been published showing significant health effects due to a contaminant which is currently emitted without being controlled by regulations.

f. The penalty for a specific violation does not appear to be having a significant deterrent effect.

11. Knowledge of systematic approaches which are useful for problem solving and planning of work activities (e.g., the "systems" approach to design).

12. Knowledge of procedures for maintaining contact with the elements of the agency's working context which affect or are affected by its performance. These elements include:

a. Other state and Federal agencies.

b. The industrial/commercial community.

c. Local governmental and quasi-governmental bodies which interface with agency activities (e.g., advisory board, variance board, public health department).

Minimum Acceptable Educational Background

Bachelor's Degree in a technical or scientific area relevant to air pollution control. Advanced education and training will be necessary to acquire the skills and knowledge required to perform the Director's tasks.

Occupational Category Description

EQUIPMENT TECHNICIAN

General Duties

The Equipment Technician operates and maintains the equipment and instrumentation used for various agency activities (e.g., laboratory analysis, source testing, meteorology). His primary functions include:

1. Performance of highly proceduralized standard installation, service, troubleshooting, repair, and calibration procedures on laboratory instrumentation and analyzers.
2. Maintenance of specialized research tools (e.g., a Smog Chamber) and the operation of them to carry out preplanned experimental procedures.
3. Collection of particulate and/or gaseous samples in conjunction with stack and mobile source tests.
4. Conduct of odor tests.
5. Installation, operation, and performance of proceduralized maintenance on the chassis and engine dynamometers.

Representative Assignments

1. Maintenance of equipment such as the colorimeter, atomic absorption spectrophotometer, and the X-ray defractometer.
2. Perform operation and maintenance of equipment such as the A.I.S.I. Automatic Sampler, High Volume Air Sampler, Coulometric Titration Analyzer and the Colorimetric air monitoring equipment.
3. Performance of a stack test, odor test, used car inspection, and Idle or ACID test.
4. Maintain a stock of spare parts as necessary to service and maintain the various instruments.

5. Establish and maintain a shop facility with the instrumentation, tools, and reference manuals necessary to install, service, troubleshoot, and maintain the various instruments.

6. Arrange for the return of malfunctioning instruments or components for factory repair as necessary.

Representative Skill and Knowledge Qualifications

1. Ability to quickly and correctly solve an algebraic equation in several unknowns using a detailed step-by-step procedure.

2. Ability to read and interpret basic equipment design drawings (e.g., electronic schematics, wiring diagrams, piping and tubing diagrams, and troubleshooting charts).

3. Ability to accurately and completely follow procedures and directions.

4. Ability to effectively use common hand tools and test instruments required in equipment maintenance (e.g., screw drivers, wrenches, ohmmeter, ammeter).

5. Ability to solder and unsolder electrical terminals.

6. Ability to determine and apply effective strategies for troubleshooting electronic equipment.

7. Basic knowledge of electronic theory, sonic conductors and state-of-the-art electronic devices and packaging.

Minimum Acceptable Educational Background

High school graduate (or equivalent) with course work in chemistry, mathematics, or physics. An alternate background would be a vocational education course in high school with emphasis on electronic equipment operation and maintenance. Further technical training will be necessary to acquire the skills and knowledge required to perform the tasks to which the individual will be assigned.

Occupational Category Description

RESOURCES ADMINISTRATOR

General Duties

Personnel of this type have a highly specialized function within the agency. Their role is high level management of the agency's financial, personnel, and material resources. Their role frequently allows them only superficial involvement in the agency's technical or regulatory efforts. The Resources Administrator's responsibilities primarily are in areas including:

1. Development and implementation of budgets.
2. Administration of agency personnel selection, training, and performance evaluation.
3. Preparation of requests for grants and other forms of financial aid.
4. Development and implementation of the agency's purchasing policy and procedures.

Representative Assignments

1. Assist in the development and continuing refinement of the agency's personnel policy and procedures.
2. Work with technical and clerical supervisors to identify current and anticipated manpower requirements.
3. Assist in the solution of personnel relations problems (e.g., act as an arbitrator or counselor in problems involving individuals and their supervisors, work with shop steward in unionized agencies).
4. Supervise administration of employee benefits program (e.g., vacation leave, retirement plans, life insurance plans, sick leave, etc.).

5. Supervise administration of the personnel performance review/ evaluation system.

6. Direct the development of purchasing procedures, materials, and paper flow.

7. Supervise the proceurement of equipment and supplies. Evaluate the justification for all major purchases.

8. Supervise the equipment inventory system and related records.

9. Coordinate development of the agency's annual budget. This requires close interaction with supervisors of the agency's various operational divisions.

10. Manage actual expenditures to maintain the budget. This effort may result in a working budget which reflects the estimated expenditures of the various divisions and groups within the agency.

11. Maintain records and prepare reports describing expenditure of grant funds.

12. Supervise administration of accounting procedures.

Representative Skill and Knowledge Qualifications

1. Ability to acquire sufficient knowledge of air pollution technology and control agency activities at a level of detail sufficient to support interaction with agency personnel in:

    a. Budget development and program planning

    b. Purchasing

    c. Development of job specifications

2. Ability to communicate effectively in both written and spoken form to a variety of technical and non-technical audiences.

3. Ability to counsel agency personnel with grievances and to work with union officials in cases in which they are involved.

4. Ability to interpret agency policy in developing and planning agency activities. This skill involves the ability to discriminate whether or not planned activities are consistent with agency policy.

5. Ability to direct or coordinate development and implementation of policies and procedures governing:

    a. Purchasing and inventory management.

    b. Personnel management.

    c. Financial management (e.g., budget planning and implementation).

6. Knowledge of procedures and techniques for developing and implementing programs in the areas of personnel selection, training, and performance evaluation.

7. Background knowledge sufficient to support evaluation and implementation of new techniques in areas including:

    a. Personnel management

    b. Organizational structure

    c. Program and budgetary planning

    d. Computerized data filing and acquisition systems

8. Knowledge of accepted procedures and techniques for planning the use of resources (personnel, material, and financial) to accomplish a specific work goal. This includes the ability to modify plans in response to contingencies (e.g., delays caused by difficulty in obtaining required information such that the production schedule is affected).

9. Knowledge of the state-of-the-art methods in program planning and budgeting (for example, Program Evaluation and Review Technique, Plan Programming Budgeting System).

10. Knowledge of basic accounting methods such as preparation of trial balance and financial statements (using general journal and general ledger methods).

11. Knowledge of procedures for developing and administering employee benefit programs including vacation leave, insurance plans, sick leave, etc.

12. Knowledge of equipment accountability and inventory control procedures.

Minimum Acceptable Educational Background

Bachelor's Degree in a relevant area of business or public administration with some course work in physical science or engineering. Advanced education or training will be required to acquire the skills and knowledge needed for tasks to which the individual will be assigned.

Occupational Category Description

PROGRAM PLANNING AND DEVELOPMENT SPECIALIST

General Duties

Personnel in this category perform a variety of staff level tasks relevant to development and evaluation of the agency's programs, policies, and regulations. Their duties typically require systematic solution of problems requiring relatively broad knowledge and skills in the areas of air pollution control and regulatory methods. Frequently, they will have to represent the agency in interactions with high level officials in both private and public sectors of the agency's constituency.

Representative Assignments

1. Literature reviews and development of data summaries regarding ambient air quality standards.
2. Development of new or modified air pollution control regulations.
3. Development of local control agencies within a coordinated state program.
4. Develop and establish a program management system to define goals and objectives and measure progress toward their attainment.
5. Provide analysis and evaluation techniques for identifying problems and quantifying program alternatives to assist in the decision making process.

Representative Skill and Knowledge Qualifications

1. Ability to communicate in written and spoken form to a variety of audience types (both technical and non-technical) at all levels of the private or public sector of the agency's constituency.
2. Ability to apply general, systematic problem solving techniques to conceptual and technical problems.
3. Ability to use data manipulation aids including desk calculators, slide rule, nomographs, data tables, and graphs.
4. Ability to prepare, read, and interpret engineering drawings, plans, or technical specifications.
5. Basic knowledge of industrial processes, equipment, and practices which are relevant to air pollution control.

6. Basic knowledge of air pollution control and regulatory technology and procedures.

7. Knowledge of literature search methods and library resources in areas relevant to air pollution control and regulatory activities.

Minimum Acceptable Educational Background

Bachelor's Degree in a technical or scientific field relevant to air pollution control (e.g., engineering, physics, chemistry). Advanced education or training will be necessary to acquire the skills and knowledge required to perform the tasks to which the individual will be assigned.