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THE STATE OF THE ART IN ENVIRONMENTAL POLLUTION
CONTROL AND IMPACT ANALYSIS

DISSERTATION

Presented to the Graduate Council of the
North Texas State University in Partial
Fulfillment of the Requirements

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By

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The problem is that of the growing pressure on business organizations as a result of federal, state, and local environmental pollution and abatement laws. Businessmen are required to file an environmental impact statement on all actions which may substantially affect environmental quality. These statements may take as long as eighteen months to file. Businessmen are asking how the costs of improving the quality of the environment should be borne.

This study analyzes federal and state pollution control and abatement legislation and provides a one-volume working explanation of those laws applicable to business operations. This analysis is limited to legislation aimed at controlling air and water pollution, and solid waste management.

Secondary data was obtained from federal, state, and local legislation and records and hearings reported in the Federal Register, Congressional Record, and transcripts of court cases. Publications from the Environmental Protection Agency and other federal agencies, and other reports and studies were used. Primary data was obtained from interviews with officials of Region VI, Environmental Protection Agency, the Small Business Administration, and selected companies in Region VI.

Eighteen companies which were required by law to file environmental assessment reports were surveyed through questionnaires, letters, and interviews, providing information on the personnel involved in filing the statements, the time and monetary cost, and the managerial and structural problems involved.

Chapter I gives a statement of the problem with emphasis on the need for ecological awareness by businessmen and background factors leading to the passage of the laws.

Chapter II focuses on those portions of the federal laws and regulations dealing with national environmental policy, air and water pollution, and solid waste disposal and recovery which are pertinent to businesses.

An analysis of applicable federal and state environmental impact statement requirements is presented in Chapter III. Chapters IV and V examine the economic factors involved in abatement efforts. Chapter IV approaches the problem from a national and industry point of view, while Chapter V pinpoints specific individual business activities. Summary, conclusions, and recommendations are given in Chapter VI.

It is concluded that many companies lack the necessary in-house expertise and personnel to comply with environmental laws. Thus, structural modifications are being instituted and consultants are being hired to assist. Small businesses find it difficult or even impossible to keep pace with the technological advances required. Many small, marginal businesses are being forced to close. Often the business is located in a one-industry

town and its closing causes a local recession.

State and local laws vary considerably from the federal laws and from each other. Each federal agency has published its own guidelines, which also vary significantly. Therefore, a business must have a thorough understanding of federal laws, agency regulations, and the laws of the state(s) in which the business operates.

A qualified employee should be hired to administer the environmental affairs of the company. One of his responsibilities should be to make the public, legislators, and industry representatives aware of the activities and views of the company.

Leveraged leasing, industrial bonds, and low-interest loans from the Small Business Administration should be considered as means of financing costs of pollution abatement. Some of the costs may be eliminated by innovation in useful and profitable by-products.

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CHAPTER I

INTRODUCTION

Statement of the Problem

In the past ten years a series of acts passed by the United States Congress and by all fifty state legislatures has generated a nationwide effort toward improving the quality of the physical environment in which Americans live by reducing several orders of magnitude the rate of pollution of our atmosphere, our water resources, and our land.¹ In addition, many areas are controlled by regional, county, or city regulations.²

All private enterprises are feeling the impact of this effort. In addition to the traditional concern with economic changes, managers today must also be acutely aware of changes in the social, political, technological and physical segments of the environment in which they operate. Such changes not only can affect the corporate performances, but can have a life or death impact on some companies. Responses to this impact have lead to sizable investments in new equipment and

¹Harold W. Henry, Pollution Control: Corporate Responses (New York, 1974), p. 4.

²William D. Hurley, Environmental Legislation (Springfield, 1971), p. 12.

often higher operating costs, as well as new thrusts in research and development activities. Frank E. Haarhoff, Senior Editor of Factory, indicates that in 1971 total industry (manufacturing and utilities) spent \$1,240,600,000 of capital expenditures for pollution control; this amount had increased to \$2,766,200,000 in 1974, a 54.9% increase.³ But the effort is not one-sided, for these research and development efforts have produced many advances in scientific knowledge that are being used in practical applications to reduce costs in some enterprises.⁴

In our free enterprise economic system, the role of producing the goods and services needed and demanded by society is assigned primarily to privately-owned business firms. These organizations and a few government-owned facilities have produced a large portion of the total pollutants in the course of providing their goods and services. Individuals, private households, and municipalities also contribute significant amounts, but manufacturers and power producing corporations are viewed by the public as the major culprits. Therefore, the thrust of the legislative acts have been directed particularly against these privately-owned business

³Frank Haarhoff, "Easing of Environmental Laws," Factory, VII (November, 1974), 29.

⁴Donald May, "A Silver Lining in the Pollution Cloud," Management Review, LXII (May, 1973), 24-28.

firms to decrease the amount of pollutants in the environment. At the same time, consumers are voicing their opinions against the increased prices that will result.

Purpose of the Study

The purpose of this study is to provide in one volume, the state-of-the-art in environmental legislation that directly affects the operations of business enterprises. National and state legislations were analyzed, as both may be applicable in the compliance efforts of businesses. In a number of cases, state agencies are the primary regulatory body with the federal government acting when state agencies fail to do so. Through the systematic analysis of relevant legislation, guidelines of general applicability were developed. These guidelines will aid managers in focusing upon the pertinent factors in pollution control compliance.

Background and Significance of the Study

In December, 1970, the Environmental Protection Agency (EPA) was established to bring together in one federal agency many environmental protection programs previously carried out by several different branches of the government. The following functions were transferred to the EPA.

1. Federal Water Quality Administration
2. National Air Pollution Control Administration
3. Elements of the Environmental Control Administration
4. Pesticides research authority from the Department of the Interior

5. Pesticides research and standard-setting programs of Food and Drug Administration
6. General ecological research from the Council on Environmental Quality
7. Environmental radiation standards programs
8. Pesticides registration of the Agricultural Research Service⁵

EPA's responsibilities encompass a range of environmental concerns--air pollution, water pollution, solid waste management, pesticides, noise, and radiation. This agency is primarily a regulatory agency and is required by law to establish or approve and enforce certain environmental standards for pollution control. These standards define what companies may or may not put into the air and water based on the "best available scientific knowledge." The standards set by EPA are legally binding. It shares the enforcement of some standards with the states, with the federal government acting only if a state fails to do so.⁶ Several of the significant laws and standards are summarized below.

Major Legislation

National Air Pollution Acts.--The national air pollution control program is carried out under the Clean Air Act of

⁵United States Environmental Protection Agency, The Challenge of the Environment (Washington, December, 1972), pp. 1-4.

⁶Ibid., p. 1.

1970 (P. L. 91-604). This law broadened and accelerated the air pollution control program launched by Congress in 1963 and amended in 1965, 1966, and 1967. The 1970 act created for the first time a truly nationwide program to control air pollution with major provisions for setting and enforcing standards.

Under this act, EPA is authorized to set Emergency Air Standards, National Air Quality Standards (primary and secondary), National Emission Standards, New Plant Standards, Motor Vehicle Emission Standards, and Fuel Standards.⁷

National Water Pollution Control Acts.--The national program to prevent, reduce, and eliminate water pollution is carried out under the Water Pollution Control Act of 1972 (P. L. 92-500). This act improved the water pollution control program initiated by Congress in 1948 and amended in 1956, 1961, 1965, 1966, and 1970 by extending the national program to all navigable water bodies in the United States--interstate and intrastate.⁸ And for the first time, the 1972 law created a system of national effluent limitations and national performance standards for industries and publicly owned waste treatment plants. Strict, but vague, standards have been set for industries under this act.

⁷United States Environmental Protection Agency, Clean Air Act (Washington, December, 1970).

⁸United States Environmental Protection Agency, The Federal Water Pollution Control Act Amendments of 1972 (Washington, January, 1973), p. 1.

By July 1, 1977, industries must meet effluent limits that reflect the use of 'best practicable' control technology. By July 1, 1983, industries must meet effluent limits that reflect the use of 'best available' technology. Also by July 1, 1983, if EPA finds that doing so is 'technologically and economically achievable,' industries must completely eliminate the discharge of pollutants.⁹

As of May, 1974, EPA standards require treatment of industrial pollutants that interfere with public treatment plants or pass through those plants without adequate treatment by new industrial sources and no later than July, 1976, for existing industrial facilities.

In addition to National Effluent Limitations mentioned above, EPA has also set the following water standards: New Plant Standards, Water Quality Standards, and a Permit and Licenses System for Sludge, Dredged Materials, Ocean Dumping, Oil Sewage from Vessels, and Drinking Water.

Solid Waste Acts.--The Solid Waste Disposal Act of 1965 marked the first significant interest by the federal government in management of solid wastes. The act provided for assistance to state and local governments, and others involved in managing solid wastes, by financial grants to demonstrate new technology, technical assistance through research and training and by encouragement of proper planning for state and local solid waste management programs.¹⁰

⁹Haarhoff, p. 29.

¹⁰The Challenge of the Environment, pp. 24-25.

The Resource Recovery Act of 1970 amended the Solid Waste Disposal Act to provide a new focus on recycling and recovery of valuable waste materials. This act led to many of the returnable, reusable and biodegradable products on the market today. The EPA is also required to publish guidelines for solid waste recovery, collection, separation, and disposal systems.¹¹

The National Environmental Policy Act.--The National Environmental Policy Act (NEPA) was passed in January, 1970, and established in the Executive Office of the President the Council on Environmental Quality with "responsibility to study the condition of the nation's environment, to develop new environmental programs and policies and to see that all Federal activities take environmental considerations into account."¹²

To ensure that environmental "amenities and values" are given systematic consideration in the federal decision-making process, NEPA requires each federal agency to prepare a statement of environmental impact in advance of each major action, recommendation or report on legislation that may significantly affect the quality of the environment. Each statement must assess in detail the potential environmental

¹¹Ibid., p. 25.

¹²Council on Environmental Quality, "Preparation of Environmental Impact Statements--Guidelines," Federal Register, XXXVIII (August 1, 1973), 20550-20562.

impact of a proposed action, and all federal agencies are required to prepare statements for public record for matters under their jurisdiction. Specific guidelines have been published for the preparation of the environmental impact statements, but basically each statement must include the following:

1. A detailed description of the proposed action including information and technical data adequate to permit a careful assessment of the environmental impact.
2. Discussion of the probable impact on the environment, including any impact on ecological systems and any direct or indirect consequences that may result from the action.
3. Any adverse environmental effect that cannot be avoided.
4. Alternatives to the proposed action that might avoid some or all of the adverse environmental effects including analysis of costs and environmental impacts of these alternatives.
5. An assessment of the cumulative, long-term effects of the proposed action including its relationship to short-term use of the environment versus the environment's long-term productivity.
6. Any irreversible or irretrievable commitments of resources that might result from the action or which would curtail beneficial use of the environment.¹³

These lengthy and involved statements must be prepared under the following circumstances:

1. Agency recommendations on their own proposals for legislations.

¹³Ibid., pp. 20553-20554.

2. Agency reports on legislation initiated elsewhere but concerning subject matter for which the agency has primary responsibility.
3. Projects and continuing activities which may be:
 - a. undertaken by an agency.
 - b. supported in whole or in part through federal contracts, grants, subsidies, loans or other forms of funding assistance.
 - c. part of a federal lease, permit, license,¹⁴ certificate or other entitlement for use.

Based on this background information and the initial review of the literature, it is believed that businessmen have only a layman's knowledge of the many national, state, and local environmental laws that directly or indirectly affect their business performance. It is also believed that as more states move toward adoption of their versions of the NEPA, business firms will be required in increasing numbers by state and local bodies to conduct environmental impact analyses on their plants, locations, and products. These impact statements will follow the basic patterns of the federal environmental impact statements required under the National Environmental Policy Act.

Definition of Terms

Abatement--the method of reducing the degree or intensity of pollution; the use of such method.¹⁵

¹⁴Ibid., p. 20551.

¹⁵Norman J. Landau and Paul D. Rheingold, The Environmental Law Handbook (New York, 1971), p. 477.

Advanced waste treatment--waste water treatment beyond the secondary or biological state that includes removal of nutrients such as phosphorus and nitrogen and a high percentage of suspended solids. Also known as tertiary treatment, it is the polishing stage of waste water treatment and produces a high quality effluent.¹⁶

Air pollution--the presence of contaminants in the air in concentrations that prevent the normal dispersive ability of the air and that interfere directly or indirectly with man's health, safety or comfort or with the full use and enjoyment of his property.¹⁷

Air pollution control region--an area designated by the federal government where two or more communities--either in the same or different states--share a common air pollution problem.¹⁸

Air quality criteria--the levels of pollution and lengths of exposure at which adverse effects on health and welfare occur.¹⁹

Air quality standards--the prescribed level of pollutants in the outside air that cannot be exceeded legally during a specified time in a specified geographical area.²⁰

Ambient air--any unconfined portion of the atmosphere; the outside air.²¹

Area source--in air pollution, any small individual fuel combustion source, including any transportation sources. This is a general definition; area source is legally and precisely defined in federal regulations. See point source.²²

Effluent--the liquid that comes out of a treatment plant after completion of the treatment process.²³

¹⁶Ibid., p. 477.

¹⁷Ibid., p. 477.

¹⁸Ibid., p. 480.

¹⁹Ibid., p. 480.

²⁰Ibid., p. 480.

²¹Ibid., p. 481.

²²Ibid., p. 481.

²³Ibid., p. 477.

Emission factor--the statistical average of the amount of a specific pollutant emitted from each type of pollution source in relation to a unit of quality of material handled, processed, or burned; e.g., the emission factor of oxides of nitrogen in fuel oil combustion is 119 pounds per 1000 gallons of fuel oil used. By using the emission factor of a pollutant and specific data regarding quantities of material used by a given source, it is possible to compute emissions for that source--information necessary for an emission inventory.²⁴

Emission inventory--a list of primary air pollutants emitted into a given community's atmosphere, in amounts (commonly tons) per day, by type of source. The emission inventory is based to the establishment of emission standards.²⁵

Emission standard--the maximum amount of pollutant that is permitted to be discharged from a single polluting source.²⁶

Environmental assessment--a written analysis submitted to the Environmental Protection Agency by its grantees or contractors (or companies) describing the environmental impacts of proposed actions undertaken. . . . The assessment is used . . . to decide if an environmental impact statement is required.²⁷

Environmental impact statement--a document prepared by a federal agency on the environmental impact of its proposals for legislation and other major actions of its proposals for legislation and other major actions significantly affecting the quality of the human environment. Environmental impact statements are used as tools for decision making and are required by the National Policy Act.²⁸

²⁴Ibid., p. 481.

²⁵Ibid., p. 481

²⁶Ibid., p. 477.

²⁷Council on Environmental Quality, "Preparation of Environmental Impact Statements," Federal Register, XL (April 14, 1975,) p. 16815.

²⁸Landau and Rheingold, p. 478.

Hydrocarbon--any of a vast family of compounds containing carbon and hydrogen in various combinations, found especially in fossil fuels. Some of the hydrocarbon compounds are major air pollutants; they may be carcinogenic or active participants in the photochemical process.²⁹

Particulates--finely divided solid or liquid particles in the air or in any emission. Particulates include dust, smoke, fumes, mist, spray, and fog.³⁰

Point source--in air pollution, a stationary source of a large individual emission, generally of an industrial nature. This is a general definition; point source is legally and precisely defined in federal regulations.³¹

Primary treatment--the first stage in waste water treatment in which substantially all floating or settleable solids are mechanically removed by screening and sedimentation.³²

Secondary treatment--waste water treatment, beyond the primary stage, in which bacteria consume the organic parts of the wastes. This biochemical action is accomplished by the use of trickling filters or the activated sludge process. Effective secondary treatment removes virtually all floating and settleable solids and approximately 90 per cent of suspended solids. Customarily, disinfection by chlorination is the final stage of the secondary treatment process.³³

Solid waste--Useless, unwanted or discarded material with insufficient liquid content to free flowing.³⁴

Solid waste--those solid materials that are beyond the reach of today's technology.³⁵

Scrap--those solid materials that can be recycled at a profit.³⁶

²⁹Ibid., p. 482.

³⁰Ibid., p. 482.

³¹Ibid., p. 481.

³²Ibid., p. 479.

³³Ibid., p. 478.

³⁴Ibid., p. 483.

³⁵The Challenge of the Environment, p. 16.

³⁶Ibid.

Scope

This research analyzes national and state legislation, with special reference to EPA Region VI--Arkansas, Louisiana, New Mexico, Oklahoma, and Texas--and ordinances affecting air pollution control, water pollution control, and waste management. Although it is realized that local environmental control ordinances are becoming more and more prevalent, the sheer number of such ordinances restrict an evaluation of them. In addition, it is realized that new amendments and standards are presently being added at an unprecedented rate; thus, this research was limited to existing and proposed legislation as of August 31, 1975.

Not-for-profit organizations are not included in the study.

Methodology

Primary and secondary data were utilized. Secondary data were gathered from actual legislation, and records and hearings reported in the Federal Register, the Congressional Record, and official State documents. Numerous Environmental Protection Agency publications were researched. Additional secondary data were found in specialized books and articles from journals and periodicals dealing with the issues of environmental pollution and control.

Interviews were conducted with officials of Region VI, Environmental Protection Agency, Dallas, Texas. Environmental

impact statements and environmental assessment statements that had been filed with this office were reviewed and analyzed for factors and circumstances leading to the initial filing of these documents and specifically what type of renovation and improvements were required by businesses to come under compliance with the requirements of the EPA.

As the Dallas Regional Office of EPA has on file only those statements initiated by it, and any federal agency can be required to file a statement or initiate action toward environmental assessments, Regional Offices of the Soil Conservation Service, the Department of Housing and Urban Development, and the Corps of Engineers were contacted for a clarification of some materials found in the literature.

To assist in obtaining data on actual practices in pollution abatement, companies which applied for permits with the Region VI and which were required to file Environmental Assessment Reports and/or Environmental Impact Statements were surveyed through questionnaires, letters and personal interviews. As the number of companies having to file environmental assessment reports to date was limited, all eighteen companies were contacted.

Through this survey, a determination was made of (1) who initiated the action toward filing the environmental assessment statements, (2) what personnel were involved in the filing of the statements, and (3) what the time and monetary costs were to the firms. This survey also provided insight into

the managerial and organizational structure problems encountered in the compliance efforts.

Organization of the Paper

Chapter II discusses the federal laws and regulations dealing with environmental policy, air pollution, water pollution, and solid waste. This chapter gives in detail the various sections of the laws which are pertinent to businesses. Examples of permit regulations and requirements are also included.

An analysis of environmental impact statements, both federal and state, is found in Chapter III. In this chapter the contents, judicial interpretations of ambiguous sections, and the process of filing environmental impact statements are discussed. Problem areas are pointed out in an effort to provide assistance for businesses having to file either federal or state impact statements.

Chapters IV and V examine the costs and problems encountered in the abatement efforts of businesses. The effects of the pollution control emphasis on the nation and on the private business are also discussed in this chapter.

The conclusions and recommendations follow in Chapter VI.

CHAPTER II

THE LEGISLATION OF POLLUTION CONTROL

Introduction

During the past quarter century, there has been an upsurge of interest in protecting our environment for the preservation of both health and industrial interests of the present generation and the preservation of resources for future generations. There has also been a great debate between the private and public sectors, primarily over the amount and kind of controls which should be issued and over who should pay for the abatement efforts. These activities, along with the activities of numerous environmentalist groups, have led to an abundance of federal, state, and local ordinances which in one way or another attempt to control and abate the pollution of our environment.

This chapter focuses on federal laws and the judicial interpretation of the federal statutes which govern the environmental area. A compilation and analysis of environmental laws and regulations of state governments follow in a subsequent section. It should be pointed out that conflicts between federal and state laws exist, and within states overlaps and conflicts exist. As a rule, when federal and

state laws conflict, the most stringent standard applies, whether state or federal.¹ As far as industry is concerned, James Parson states: "As these laws are national [in scope], there are no places where performance is less restricted. However, there are places that are more restricted, some to the point where industry is not welcome."²

Enforcement Organization

Federal control of air pollution, water pollution, solid waste management, pesticides, and noise is the responsibility of the Environmental Protection Agency. This regulatory giant, established in December, 1970, presently operates with a staff of over 9,000 and a fiscal budget of \$731 million for 1975.³ It operates through ten regional offices, which are the official contacts for states and industries. Permits and negotiations for performance limits are handled from the regional offices.

This agency is required by law to approve or establish and enforce certain environmental standards for pollution control. These standards are legally binding. EPA took

¹Norman J. Landau and Paul D. Rheingold, The Environmental Law Handbook (New York, 1971), p. 137.

²James L. Parson, "Environmental Requirements," The Conference Board Record, XII (February, 1975), p. 58.

³Frank Haarhoff, "Easing of Environmental Laws," Factory, VII (November, 1974), p. 30.

2,846 enforcement actions against violators of water, air, and pesticide laws in the fifteen months between January, 1973, and March, 1974. By November, 1974, \$8,353,193 worth of fines were levied against polluters.⁴

The Dallas Region, Region VI, serves the states of Texas, New Mexico, Louisiana, Arkansas, and Oklahoma. A list of the location and addresses of all ten regions are in Appendix A.

National Laws and Regulations

The National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA), though actually signed into law on January 1, 1970, is called the bedrock⁵ and the Bill of Rights⁶ for environmental control by the federal government. This act act, Public Law 91-190,⁷ has two significant sections: (1) Section 202, which establishes the Council on Environmental Quality and (2) Section 102(2)(c), the most discussed, crucial, and controversial section, which requires every federal agency proposing an action that will significantly affect the quality of the environment to draw up a statement on the environmental impact of the proposed action.

⁴Ibid.

⁵Glenn L. Paulson, advisory editor, Environment, U.S.A. (New York, 1974), p. 259.

⁶Landau and Rheingold, p. 137.

⁷The National Environmental Policy Act of 1969, Public Law 91-190, January 1, 1970 (42 u.s.c. 4321-4347).

The three-member Council on Environmental Quality is appointed by the President with the approval of the Senate. The Council is empowered to employ and compensate officers, employees, experts, and consultants as necessary to carry out its functions. Section 204 of NEPA assigned the Council multiple duties and functions, the most important of which are listed below:

1. To assist and advise the President in the preparation of the Environmental Quality Report required by Section 201.
2. To review and appraise the various programs and activities of the Federal Government for the purpose of determining the extent to which such programs and activities are contributing to the achievement of the national environmental policy.
3. To develop and recommend to the President national policies to foster and promote the improvement of environmental quality to meet the conservation, social, economic, health, and other requirements and goals of the Nation.⁸

Realizing the probably significance of this Council, a second act was passed to give support to this group--The Environmental Quality Improvement Act of 1970.

The Environmental Quality Improvement Act of 1970⁹

The primary purpose of this act was to authorize an office of Environmental Quality to provide the professional and administrative staff for the Council on Environmental Quality.

⁸Ibid.

⁹Peter E. Black and Les P. Herrington, editors, Readings in Environmental Impact (New York, 1974), pp. 16-18.

The chairman of the Council serves as the director of the office, with a deputy director being appointed by the President with the Senate's approval.

Basically, this office is to assist the federal agencies and departments in appraising the effectiveness of existing and proposed facilities, programs, policies, and activities of the federal government, and to assist the federal departments and agencies in the development and interrelationship of environmental quality criteria and standards established through the federal government.

The Clean Air Acts and Amendments

Air pollution was not discussed in federal legislation until 1955, and even then only at the level of research and technical assistance to the states. The major public laws dealing with air pollution and their most important provisions are listed in Appendix B. The 1963, 1967, and 1970 acts and amendments are discussed below.

The first vigorous federal attack on air pollution problems was provided by the Clean Air Act of 1963,¹⁰ which is still the fundamental federal law. This law granted permanent authority to federal air pollution control activities; provided for federal grants to state and local air pollution control agencies to establish and improve their control programs; provided for federal action to abate interstate air

¹⁰Paulson, p. 261.

pollution through a system of hearings, conferences, and court actions; and provided for an expanded federal research and development program with particular emphasis on motor vehicle pollution and sulfur oxide emissions from fuel oil and coal combustion.

The Clean Air Act of 1967 (42 U.S.C. Sec. 1857) provided for steps to clean ambient air, created a National Air Pollution Control Administration as part of Health, Education and Welfare (HEW), and set motor vehicle emission standards.¹¹ This multiple-purposed act was designed to protect and enhance the quality of the nation's air resources so as to promote the public health and welfare and the productive capacity of its population; to provide technical and financial assistance to state and local governments in the development and execution of air pollution prevention and control programs; and to encourage and assist in the development and operation of regional air pollution control programs.

Passed as an amendment to the Clean Air Act of 1963, this act provided for a system to handle the abatement, prevention, and control of air pollution on a regional basis. These regional programs, which now involve the coordinated efforts of federal, state, and local governments, "were initiated in any geographical area, without regard for state boundary lines, that endured common air pollution problems."¹² However, the

¹¹Landua and Rheingold, pp. 138-139.

¹²U. S. Environmental Protection Agency, Federal Air Quality Control Regions (January, 1972), p. 1.

abatement, prevention, and control of air pollution at the point sources is primarily the responsibility of the state and local governments in the respective regions.

Section 107(2)(a) of the 1967 amendments directed the Secretary of HEW to designate Air Quality Control Regions "based on the jurisdictional boundaries, urban-industrial concentrations, and other factors, including atmospheric areas, necessary to provide adequate implementation of air quality standards."¹³

In June, 1968, HEW's Secretary named thirty-two urban areas, where pollution levels were high, for designation as Federal Air Quality Control Regions. An additional twenty-five areas were announced in May, 1969, and on April 25, 1970, thirty-four additional interstate areas were announced for designation.¹⁴

Amending the Clean Air Act of 1967, the 1970 Clean Air Act Amendments¹⁵ focused power and responsibility over the nation's air pollution control effort in the federal Environmental Protection Agency, moving it from the Department of Health, Education and Welfare. Four significant improvements in these amendments over the 1967 Act lie in (1) the setting

¹³Ibid.

¹⁴Federal Air Quality Control Regions, p. 2.

¹⁵Paulson, p. 262.

of strict deadlines and procedures for carrying out the policies, (2) articulating clear standards for decisions by public and private officials, (3) moving the responsibility of controlling the air pollution control effort to the federal Environmental Protection Agency from the Department of Health, Education and Welfare, and (4) giving the citizen the right to sue any party (corporation, association, state, municipality, or instrumentality of the United States) who is alleged to be in violation of regulations if enforcement agencies are unable or unwilling to act.

The 1970 Amendments require the EPA Administrator to publish air quality criteria for pollutants acknowledged as harmful to health or welfare and to publish report techniques that can be employed to control these pollutants. The Administrator is authorized to set two types of national ambient air quality standards. Primary standards were set at levels that are felt to be adequate to protect human health. Secondary standards were imposed at levels to protect human "welfare" values. One authority interpreted these secondary as meant to safeguard all values other than health (which are not protected by the primary standards) including visibility, plant and animal life, buildings, and materials. Primary standards must be achieved within three years of the approval of a plan implementing them or by 1975, whichever is earlier.¹⁶

¹⁶Federal Air Quality Control Regions, p. 3.

No specific time was given for the achievement of secondary standards--"within a reasonable length of time."¹⁷

The EPA announced its standards for major air pollutants on April 30, 1971, and they are presented in Table I. Expert sources indicate that these standards are strict by almost any measurement technique. The director of the EPA has the authority to add to the list any pollutants he finds dangerous to public health and welfare and propose standards for the pollutant within one year of the listing.

States, if they choose, can set more stringent standards. In addition, the language and legislative history of the amendments prohibit the states from permitting the significant degradation of air quality in regions where the air is already of higher quality than necessary to meet the requirements of the secondary standards.¹⁸

The Clean Air Act requires each state to formulate an air pollution abatement plan for each air quality control region in the state and for those parts of interstate regions which fall within the state. These plans must be detailed enough to describe specifically how the state intends to achieve and maintain the primary and secondary standards in the required time, and demonstrate that the state has the personnel and legal authority to carry out and enforce the plan.

¹⁷Landau and Rheingold, p. 138-139.

¹⁸Laurent Hodges, Environmental Pollution (New York, 1973), p. 318-319.

TABLE I
 AMBIENT AIR QUALITY STANDARDS

	Primary (Enforcement by Summer of 1975)	Secondary (No Time Limit on Enforcement)
Particulates Micrograms/cu. meter Annual Geometric mean Max. 24-hr. conc.*	75 260	60 150
Sulfur oxides Micrograms/cu. meter Annual Arith. Aver. Max. 24-hr. conc.* Max. 3-hr. conc.*	80 (.03 ppm) 365 (.14 ppm)	60 (.02 ppm) 260 (.10 ppm) 1300 (.50 ppm)
Carbon Monoxide Milligrams/cu. meter Max. 8-hr. conc.* Max. 1-hr. conc.*	10 (9.0 ppm) 40 (35.0 ppm)	10 40
Photochemical oxidants Micrograms/cu. meter Max. 1-hr. conc.*	160 (.08 ppm)	160
Hydrocarbons Micrograms/cu. meter Max. 3-hr. conc.* (6-9 a.m.)	160 (.24 ppm)	160
Nitrogen oxides Micrograms/cu. meter Annual Arith. Aver. 24-hr. max. aver.	100 (.05 ppm)	100 ..

*Not to be exceeded more than once a year.

Source: Steven Ross, "Current Legislation," Chemical Engineering/Deskbook Issue, (June 21, 1971), p. 11.

In addition to these requirements, the state plans should include a survey of each region's existing air quality and detailed inventory of the emissions from all pollution sources in the region. This control strategy must set forth all the measures that will be taken to assure that the region's air quality meets the national standards. Of particular interest to businesses is the requirement that these measures include emission limitations on particular sources and other control procedures, such as process changes, fuel controls, and land use and transportation controls, if they are necessary to meet standards. Finally, the plans by the states must include a system for monitoring emissions from individual point sources and a network for sampling ambient air quality. All information must be reported and made available to the public.¹⁹

To obtain a permit for air emissions, a company must apply to the proper state authorities and satisfy them that it can and will meet the state standard. An interesting sidelight to the granting of a permit is the need to satisfy an item in the original law (Clean Air Act of 1963) which says its purpose is to protect and enhance. It has been decided by the courts that this meant one could not degrade air quality.

The 1970 Amendments require the EPA to develop "new source" performance standards for industry based on best demonstrated performance. The states can apply these requirements to all new industry and establish timetables for existing

¹⁹Ibid.

industry to comply. However, enforcement may be cumbersome since EPA cannot force compliance until after the point source begins operations.

Initially, source performance standards were developed by the EPA for larger power houses, cement plants, municipal incinerators, and nitric acid and sulfuric acid plants. The list has been extended to include asphalt and concrete plants, petroleum refineries, storage vessels, secondary lead smelters, brass and bronze ingot production plants, iron and steel mills, and sewage treatment plants. Copies of these standards are available from the regional offices of the Environmental Protection Agency.

Any polluter who knowingly or willfully violates a regulation or order issued by EPA or a state plan, may be subject to fines up to \$25,000 per day and/or a year in prison. EPA can ask that offending sources be shut down immediately where clear danger to health can be proven.

Federal Air Quality Control Regions are officially designated in Title 4, Part 81 of the Code of Federal Regulations. Jurisdictions included in Arkansas, Louisiana, Oklahoma, New Mexico, and Texas Air Control Regions are shown in Appendix C. A map indicating the Air Quality Control Regions in EPA Region VI (Dallas Region) is included.

Federal Water Pollution Legislation

Water pollution legislation at the federal level dates back to the Refuse Act of 1899 and twelve additional acts shown in Appendix D have since been enacted.²⁰ The most recent and most significant of these acts is the Federal Water Pollution Control Act Amendments of 1972.²¹ Those portions of this act which directly affect businesses will be discussed in detail.

The Federal Water Pollution Control Act Amendments of 1972.--This act, Public Law 92-500, mandates a widespread federal-state campaign to prevent, reduce, and eliminate water pollution. The two primary goals of the act are:

1. To achieve wherever possible by July 1, 1983, water that is clean enough for swimming and other recreation uses, and clean enough for the protection of and propagation of fish, shellfish, and wildlife.
2. And by 1985 to have no discharge of pollutants into the Nation's waters.²²

This law builds upon and improves earlier federal water pollution control legislation (see Appendix D) and initiates two principal changes:

1. The law extends the federal pollution control program to all United States waters--interstate and intrastate.

²⁰Hodges, p. 319.

²¹Public Law 92-500, 86 Stat. 816 (1972).

²²U. S. Environmental Protection Agency, The Federal Water Pollution Control Act Amendments of 1972--Highlights (January, 1973), p. 1.

2. The law authorizes the EPA to seek an immediate court injunction against polluters when water pollution presents 'an imminent and substantial endangerment' to public health, or when it endangers someone's livelihood.²³

Although found in previous legislation, the law also increases federal aid to help local governments build sewage treatment facilities and make financial aid available to small businesses through the Small Business Administration to help them control water pollution. A discussion of the types of financial aid available to businesses is found in Chapter IV.

The states retain primary responsibility to prevent, reduce, and eliminate water pollution within the new national program. And like the other laws that have been discussed, if for whatever reasons a state fails to fulfill its obligations under the law, the federal government (through the Environmental Protection Agency) is directed to take action.

National Pollutant Discharge Elimination System

A major component of this law is the establishment of a new national permit program called the National Pollutant Discharge Elimination System (NPDES).²⁴ According to Section 402 of the Act, "point source" discharges--industries, municipal treatment plants, feedlots, and other discrete

²³Ibid.

²⁴United States Council on Environmental Quality, Environmental Quality--1973 (Washington, September, 1973), pp. 174-175.

sources--must obtain a permit specifying allowable amounts and the various constituents of effluents and a schedule for achieving compliance. Permittees are required to "monitor their discharges, to keep records of monitoring activities and to report periodically on what is occurring with regard to these discharges."²⁵

Specific requirements for a given discharger are determined by weighing "state priority, effluent volume, economics of data gathering and processing, discharger's previous history, potential public health hazards, receiving water use, etc."²⁶ The principal use of this self-monitoring data by the EPA regulatory agency or state agency is basically to assess compliance with the permit limitations.

Businesses should be aware that self-reported data indicating permit violations may be used as primary evidence in an enforcement action. It is believed that in most cases, however, efforts will be made to verify or supplement such data through EPA or state surveillance investigations. Nevertheless, where independent evidence is thus gathered by the regulatory agency, self-monitoring data will be used as corroborative evidence in an enforcement action.²⁷ The EPA

²⁵U. S. Environmental Protection Agency, Office of Water Enforcement, Permit Program Guidance for Self-Monitoring and Reporting Requirements (Washington, October 1, 1973), pp. ii.

²⁶Ibid., p. 1.

²⁷Ibid.

may enforce permit conditions and other requirements of the law by issuing administrative orders that are enforceable in court. Penalties for violating the law range from a minimum of \$2,500 to a maximum of \$25,000 per day, and up to one year in prison for the first offense, and up to \$50,000 a day and two years in prison for subsequent violations.²⁸ Except for trade secrets, any information obtained by EPA or a state about a polluter's discharges must be made public or available to the public.

Monitoring and reporting for municipal and industrial dischargers differ because industrial limitations are based on best practicable control technology currently available, whereas municipal discharges are based on secondary treatment.²⁹ In spite of these differences, each permit should address itself to the definition of a sample type, the frequency of analysis, the list of parameters to be analyzed, and the frequency of reporting to the regulatory agency.

"Monitoring Discharge Report" forms, EPA Form 3320-1 (see Appendix E), have been developed to report self-monitoring data provided by dischargers as a condition of their permits. Identifying information, specific parameters, effluent limits, and sampling and analysis requirements are entered by the permit office prior to sending to the permittee, and each

²⁸The Federal Water Pollution Control Act Amendments of 1972--Highlights, p. 8.

²⁹Ibid.

discharge report form may be used for the combined measurement of an entire facility, combination of a selected outfall, or a single outfall.³⁰

Public Law 92-500 required the administrator to publish the regulations providing "guidelines" for uniform effluent limits for point sources from industrial categories by October, 1973.³¹ In addition to issuing effluent guidelines for existing point sources, EPA must set, when needed, special effluent standards for new industrial point sources, based on best available demonstrated control technology. It is emphasized that only those effluent parameters of major significance should be limited and monitored. Minimum requirements for major parameters common to broad industries are shown in Table II. Additional parameters may be included in the monitoring requirement because of specific situations within a company. To date, such effluent legislation guidelines have been promulgated for thirty industries, including almost 200 subcategories.³²

It is to be noted that the new permit system, with a maximum of five years on each issuance, applies only to those organizations that discharge their waste waters directly into the waters of the United States, but every discrete discharge

³⁰Permit Program Guidance, p. 10.

³¹Carl J. Schafer and Nicholas L. Schafer, "Complying with Discharge Regulations," Environmental Science and Technology, Vol. VIII (October, 1974), p. 904.

³²Ibid., p. 904.

TABLE II

MAJOR PARAMETERS BY BROAD INDUSTRIAL CATEGORIES

	Fecal Col.	BOD	COD	Metals	TSS	Oil	Temp.	pH	Flow
Agrarian Products (food, forest, tanning, etc.)	X	X			X				X
Chemical Plants (organic, inorganics, petroleum, textile, cement, fiberglass, pesticides, pharmaceuticals, etc.)		X	X		X	X		X	X
Metal Processing (steel, aluminum, motor vehicles, electroplating, etc.)			X	X	X	X		X	X
Mining and Milling (coal, hard rock, etc.)				X	X			X	X
Light business (local service industry, e.g. restaurants, gas stations, laundries, etc.)			X			X			X
Cooling Water									
Power Industry							X		X
Other							X	X	X

Only parameters of major significance to each specific area will be monitored for reporting purposes in order to limit processing and review of irrelevant data. The above table shows major parameters common to broad areas.

must have a separate permit. Manufacturing plants discharging effluents to a publicly owned treatment work are required to meet certain pretreatment requirements of such caliber as to assure that pollutants reaching "U. S. waters" will not be in excess of that limit which would be allowed if the discharge were direct. Businesses complain loudly about the provision calling for municipalities to recover new treatment plant costs from industry in proportion to the amount of industrial wastes treated.³³

Monitoring Discharge Report forms are required to be filed on a regular basis with the EPA Regional Offices or approved state offices. As of October, 1974, authority to administer the permit regulations had been delegated to fifteen states, with ten additional states having filed application for this authority.³⁴ Reports are required at the following frequency:

Quarterly:	Any discharge greater than 1 mgd flow Any discharge classified as major and/ or toxic All municipal treatment plants
Semi-Annually:	Any industrial discharge less than 1 mgd ³⁵

³³"Water Pollution Law Draws Flood of Complaints," Chemical Week, XXXI (October 16, 1974), 37.

³⁴Schafer and Schafer, p. 903.

³⁵Permit Program Guidance, p. 11.

The determination of effluent limitations and reporting frequency also takes into consideration the fact that certain pollutants shown in the effluents may already be present in the intake water in some degree. Credit, if specifically requested by the industry, or if found to be significant by the regulatory agency, may be given for that pollutant in establishing discharge limitations. Consideration should also be given to toxic pollutants, although no specific mention is made of them in chart of effluent limitations. They are not shown because of the wide variety of potentially toxic pollutants which could be encountered across the width and breadth of each industry.

This permit program has been very active. As of July 1, 1974, the Environmental Protection Agency had issued 8,000 industrial permits out of about 28,000, 4,000 municipal permits out of 16,000, 1,000 permits for state and federal facilities, and about 200 agricultural permits.³⁶

Solid Waste Acts and Amendments

As solid waste management became increasingly critical in the 1960's, federal legislation aimed at the solid waste problem was passed. However, solid waste remains substantially a problem of local control and concern.³⁷ Three acts

³⁶Schafer and Schafer, p. 904.

³⁷For information on state and local ordinances, see the EPA publication Solid Waste Laws in the U. S. Territories and States, 1972.

and amendments have been extremely important in this area: the 1965 Solid Waste Disposal Act,³⁸ the Resource Recovery Act,³⁹ and the Solid Waste Disposal Act Amendments of 1973.⁴⁰ These acts authorized the Department of the Interior and the Department of Health, Education and Welfare to direct research and development programs on the collection, disposal and reuse of wastes.

In Section 203 of the Solid Waste Disposal Act Amendments, solid waste was defined:

Solid waste means garbage, refuse, and other discarded solid materials, including solid-waste materials resulting from industrial, commercial, and agricultural operations, and from community activities, but does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial waste water effluents, dissolved materials in irrigation return flows or other common pollutants.⁴¹

The term solid waste disposal was defined as "the collection, storage, treatment, utilization, processing, or final disposal of solid waste."⁴²

The Solid Waste Disposal Act and the Resource Recovery Act authorize grants to public and private authorities, agencies, institutions, and individuals to conduct research

³⁸ Solid Waste Disposal Act, P. L. 89-272, S. 306.

³⁹ Resource Recovery Act of 1970, P. L. 91-512.

⁴⁰ Solid Waste Disposal Act Amendments, P. L. 93-14.

⁴¹ Ibid.

⁴² Ibid.

with special emphasis on recycling, the health and welfare effects of solid waste, and operation and financing for solid waste disposal programs. These grants, which typically go to college and universities, are granted with the provision that all information, processes, patents, etc., resulting from the grants will be made available to industries on a fair and equitable basis.⁴³

The Resource Recovery Act shifted some of the emphasis from solid waste disposal to scrap and resource recovery. As the Solid Waste Disposal Act issued grants for the disposal of waste, this act made available special resource recovery system demonstration grants to the state, municipal, and "intermunicipal" agencies to test full resource recovery systems. Under the provisions of this act, the system must be area-wide in scope and relevant and effective for a variety of sizes of communities and a variety of solid waste problems. In addition, the systems must meet the solid waste management guidelines recommended by EPA and be made available for public use. Special training grants to state and local governments, cooperative agencies and educational institutions to support education and training of solid waste personnel at all skill levels are provided by the Resource Recovery Act.

In 1973, thirty-two states had solid waste control laws on their books and twenty-five states had regulations requiring

⁴³Ibid.

solid waste disposal permits. In EPA Region VI, Arkansas, Oklahoma, and Texas have solid waste laws; New Mexico and Louisiana have permit provisions.⁴⁴

Summary

Federal legislation aimed at the control of the environment dates back to 1899 with the Refuse Act of 1899. This act prohibited discharges into navigable rivers. Since 1899 eleven additional laws have been passed to control water pollution, eight laws which control air pollution, and three laws which control the disposal of solid waste.

Each law passed possessed more stringent standards. At this point the standards are extremely strict and the laws are being passed at such a rapid rate that businessmen argue that new pollution control technology cannot keep pace. Businessmen also argue that new laws are not given an opportunity to work before another law is passed.

Though the laws were originally aimed at the protection of humans, they have been extended to cover wildlife and vegetation and look toward a preservation and recovery of resources for future generations. And as each extension takes place, additional costs are added. This is a complicating factor for businessmen for ultimately these increased costs must be borne by the public. The cost aspect of federal legislation is discussed in detail in Chapter IV.

⁴⁴Council on Environmental Quality, Third Annual Report (Washington, 1972), pp. 173-174.

CHAPTER III

AN ANALYSIS OF ENVIRONMENTAL IMPACT STATEMENTS

Introduction

Over two centuries ago Edmund Burke emphasized the need for keeping close surveillance on our environment for the benefit of all. He stated very emphatically that "the public interest requires doing today those things that men of intelligence and good will would wish, five or ten years hence, had been done."¹

On January 1, 1970, with the passage of the National Environmental Policy Act, the nation and all people within it were made legally responsible for restoring, protecting, and enhancing the quality of the environment. To assist in this effort, Congress stated in the most significant section of the act that an environmental impact statement must be prepared by federal agencies in connection with every major effort which significantly affects the environment.

This chapter is written to give a thorough analysis of impact statements, how they work, when they must be filed, what they must contain, legal interpretations, and guidelines to assist businesses in the filing of the statements. Although

¹United States Council on Environmental Quality, Fifth Annual Report (Washington, 1974), p. 371.

all of what is written in this chapter applies indirectly to state environmental impact requirements, several state laws will be analyzed to give the reader an idea of what is occurring on the state level in this area.

Actions Covered and Contents of Impact Statements

Environmental Impact Statements (EIS's) are to be filed, according to Section 102(2)(c) of the National Environmental Policy Act (NEPA),² by all federal agencies on all major actions involving their agency which will significantly affect the quality of the human environment.

The National Environmental Policy Act also instructs the Council on Environmental Quality (previously discussed) to issue guidelines for the preparation of the EIS. The initial guidelines were issued April 23, 1971,³ and the final guidelines on April 14, 1975.⁴ Based on these guidelines EIS's must cover a wide variety of projects and actions, including those dealing with weather modification, dam building, airport and highway construction, nuclear-power station erection, transportation and handling of hazardous materials, mineral

²National Environmental Policy Act of 1969, 42 U. S. C., (January 1, 1970), Sec. 4321-4347.

³Council on Environmental Quality, "Guidelines for Statements on Proposed Actions Affecting the Environment," Federal Register, XXXVI (1971), 7724.

⁴Council on Environmental Quality, "Preparation of Environmental Impact Statements--Final Regulations," Federal Register, LXXII (April 14, 1975), 72.

land reclamation, coastal developments, stream channelization, natural oil and gas pipeline construction, and some new products produced by private firms. These statements must consider such matters as increased water requirements, changes in urban population and location, increased traffic, and related problems.⁵

Agency recommendations on their own proposals for legislation and reports on legislation initiated elsewhere (but concerning subject matter for which the agency has primary responsibility) require an impact statement. Projects and continuing activities undertaken directly by an agency, as well as those supported in whole or in part by federal contracts, grants, or other forms of funding assistance also require an impact statement. Significantly for businesses, statements are generally prepared on projects and activities which are part of a federal lease, permit, license, certificate, or other entitlement for use. Specifically, the Act orders federal agencies to prepare EIS's based on reports submitted by the companies involved.

According to the guidelines, all of the following actions are considered major and/or environmentally significant:

1. Actions that are highly controversial for environmental reasons.
2. Actions which are precedents for much larger actions which may have considerable environmental impact.

⁵Stephen D. Kelly, "Environmental Impact Statements--Boon or Boondoggle," Public Works, CIV (October, 1973), p. 73.

3. Actions which are decisions in principle about major future courses of action.
4. Actions which are major because of the involvement of several federal agencies, even though a particular agency's individual action is not major.
5. Actions whose impact includes environmentally beneficial as well as environmentally detrimental effects.⁶

The EIS's must contain the following major elements:

1. A detailed description of the proposed action including information and technical data adequate to permit a careful assessment of environmental impact.
2. An explanation of the probable impact on the environment, including any impact on ecological systems and any direct or indirect consequences that may result from the action. This discussion should include beneficial and adverse impacts.
3. Any adverse environmental effects that cannot be avoided should the proposal be implemented.
4. Alternatives to the proposed action that might avoid some or all adverse environmental effects, including analyses of costs and environmental impacts of these alternatives.
5. An assessment of the cumulative, long-term effects of the proposed action, including its relationship to short-term use of the environment versus the environment's long-term productivity.
6. Any irreversible or irretrievable commitment of resources that might result from the action or which would curtail beneficial use of the environment.
7. A discussion of problems and objectives raised by other federal, state, and local agencies, private organizations and individuals during review process of the draft statements.⁷

⁶"Preparation of Environmental Impact Statements--Final Regulations," p. 40.

⁷Ibid., p. 72.

Judicial Interpretations of the Contents and Coverage
of Environmental Impact Statements

The opening sentence of Section 102 provides that all agencies of the federal government shall comply with the requirements of this section "to the fullest extent possible." Does this statement provide a built-in loophole for agencies? The courts have held that it does not provide such a loophole. NEPA's requirements are not discretionary nor are they inherently flexible. They must be complied with unless clearly in conflict with other statutory authority.⁸ The Council on Environmental Quality's guidelines state:

Section 105 of the Act provided that 'the policies and goals set forth in this Act are supplementary to those set forth in existing authorization of Federal agencies.' This means that each agency shall interpret the provisions of the Act as a supplement to its existing authority and as a mandate to view traditional policies and missions in the light of the Act's national environmental objections. . . . The phrase 'to the fullest extent possible' in section 102 is meant to make clear that each agency of the Federal Government shall comply with that section unless existing laws applicable to the agency's operation expressly prohibit or make compliance impossible.⁹

An Arkansas court interpreted this phrase as one of emphasis rather than one of limitation, and a Wisconsin court added that it is meant to apply to projects even when the basic federal approval or action remains to be given.¹⁰

⁸"Preparation of Environmental Impact Statements--Final Regulations," p. 40.

⁹Ibid.

¹⁰Environmental Defense Fund v. Corps of Engineers, 342 F. Supp. 1217, 4 ERC 1408 (1972).

One of the few "enforcement teeth" in NEPA, although it is indirect, is that applications for federal funding or grant assistance may be refused if it can be shown that NEPA requirements have not been complied with "to the fullest extent possible."

Based on the phrase "major federal actions significantly affecting the quality of the human environment," there are at least three factors to be interpreted in the analysis of whether an impact statement must be prepared: (1) is the action proposed a "major federal action"?, (2) will that major federal action "significantly affect the quality of the human environment"?, and (3) what is meant by "human environment"; what is its scope?¹¹

In *National Resources Defense Council v. Grant*,¹² the court defined a "major federal action" as one which requires substantial planning, time, resources, and expenditures. As is obvious, this statement did very little in clearing up the vagueness and ambiguity. However, several agencies have attempted to clear up the vagueness by defining what constitutes a major action for those filing reports through their agency. It would be advised that those seeking compliance with any agency contact that agency directly for any guidelines which are available.

¹¹Lyndon B. Johnson School of Public Affairs, Environmental Impact Statements: Effects on Program Implementation (Austin, 1974), p. 26.

¹²Ibid.

One method currently available for defining what constitutes a major action eliminates any project falling below a pre-defined threshold. For example, projects which involve less than \$5000,000 in new construction from all sources are not considered major actions by Housing and Urban Development,¹³ and the Federal Power Commission has ruled that projects involving less than 2,000 horsepower are not major actions.¹⁴

It is not known at this time whether such "artificial standards" will stand the test of the courts, as the courts will weigh this factor along with many other factors. While the agency administrator has a degree of discretion in determining whether the proposal before him is a major federal action significantly affecting the quality of the human environment, his decisions will necessarily be measured against the circumstances and the environmental effects of the particular project.

The phrase "significantly affecting the quality of the human environment" has been defined by a North Carolina court as "any action that substantially affects, beneficially or detrimentally, the depth or course of streams, plant life, wildlife habitats, fish and wildlife, and the soil and air. . . . 1

¹³Department of Housing and Urban Development, Procedures dated July 16, 1971, Federal Register, Vol. 37, No. 204, P. 22677.

¹⁴Federal Power Commission, Procedures dated December 4, 1970, Federal Register, Vol. 35, p. 18,959.

¹⁵Natural Resources Defense Council v. Grant, 341 F. Supp. 356, 3 ERC (1972).

This court provided two measures for use in determining whether a project has significant effects:

1. the extent to which the proposed action will cause adverse effects in excess of those created by existing uses in the area affected by it
2. the absolute quantitative [emphasis added] adverse environmental effects of the action, including the cumulative harm that results from its contribution to the existing adverse conditions or uses in the affected areas.¹⁶

On the definition of the human environment, the courts have generally concluded that the human environment extends beyond such natural elements as plants, animals, soil, water, and air. One court expressed it thusly:

The National Environmental Policy Act contains no exhaustive list of so called 'environmental considerations,' but without questions its aims extend beyond sewage and garbage and even beyond water and air pollution The Act must be construed to include protection of the quality of life for city residents. Noise, traffic, overburdened mass transportation systems, crime, congestion, and even the availability of drugs all affect the human environment.¹⁷

Judicial Interpretations of Contents

Numerous questions have arisen as to how and to what degree agencies examine the seven basic areas set forth in the CEQ Guidelines (see pages 41 and 42) and describe them in the environmental impact statement. These answers are emerging from court cases challenging NEPA and the adequacy of impact statements.

¹⁶Ibid.

¹⁷Handy v. Mitchell, 460 F 2d. 640, 4 ERC 1152.

Early in the history of NEPA, it was made clear that together the seven areas are intended to bring "full disclosure" of the environmental implications of any impending decisions.¹⁸ However, there have been differences of opinion about what constitutes "full disclosure." What seems to be the most popular interpretation was expressed by an Arkansas court in 1972:

A 102 statement must thoroughly discuss the significant aspects of the probable environmental impact of the proposed agency's action. By definition this excludes the necessity for discussing either insignificant matters, such as those without impact, or remote effects, such as mere possibilities unlikely to occur as a result of the proposed activity.¹⁹

Although Section 6(a)(1) of the Council on Environmental Quality Guidelines provides that an impact statement should include technical data and, where needed, maps adequate to permit a careful assessment of the environmental impact by commenting agencies, the courts have found it unnecessary to include maps if the contents of the statements are sufficiently explanatory without them.²⁰

Duty to Consider Opposing Views

Section 102 (c)(1) of NEPA states that a federal agency preparing an impact statement must consult with and obtain

¹⁸Council on Environmental Quality, Third Annual Report (Washington, 1972), p. 242.

¹⁹Environmental Defense Fund v. Corps of Engineers, p. 1408.

²⁰Brooks v. Volpe, 350 F. Supp. 269, 4 ERC 1493.

the comments of any other federal agency which has "jurisdiction by law or special expertise with respect to any environmental impact involved."²¹ These comments from federal, state, and local agencies, as required by NEPA, are to be made available to the President, Council on Environmental Quality, and the public. The comments accompany the proposal throughout the review process.

Few questions have been raised concerning the requirement that agency and public comments be considered and included in the impact statement, however, many questions have arisen regarding the need to consider opposing views expressed by private individuals, groups, and organizations. In *Natural Resources Defense Council v. Morton*, the court cited the "Cannikin" decision as supporting the view that an agency's duty to consider opposing views is subject to a rule of reason and is limited to those opposing views that are responsible. It is stressed by the court that the impossible is not being asked and if an alternative has little or no effect on the environment, a statement to that fact is all that is necessary.²²

Balancing Opposing Considerations

Section 102 (2)(b) of NEPA requires that federal agencies balance environmental values and economic-technical values in

²¹National Environmental Policy Act of 1969, Sec. 4321-4347.

²²Natural Resources Defense Council v. Morton, 458 F. 2d. 827, 3 ERC 1558.

the decision-making process. Judicial interpretation has established the requirement that a description of such balancing efforts be included in the impact statement.²³

Since NEPA requires a balancing of values and as a result of judicial interpretations a description of such balancing must be included in the impact statement, the essential scope and nature of the balancing process had to be defined. The Calvert Cliffs court opinion was that NEPA mandates a "rather finely tuned and systematic balancing in each instance."²⁴ In his book, National Environmental Policy Act in the Courts, Harold Green wrote that environmental costs and benefits must be quantified and the balancing process should consist of a cost-benefit analysis.²⁵ The Calvert Cliffs court decision states that so long as the actual balance of costs and benefits is neither arbitrary nor fails to give sufficient weight to environmental values, the impact statement is unlikely to be reversed in a court of law.

The difficulty in carrying out NEPA's directive to quantify environmental amenities was raised as an issue in Environmental Defense Fund v. Corps of Engineers. The court

²³Scherr v. Volpe, 466 F. 2d. 1027, 4 ERC 1435.

²⁴Calvert Cliffs Coordinating Committee, Inc. v. Atomic Energy Commission, 499 F. 2d. 1109, 2 ERC 1779.

²⁵Harold P. Green, National Environmental Policy Act in the Courts (Washington, 1972), p. 34.

concluded that because NEPA was a reasonable act and does not require the impossible, the failure to develop quantitative measures would not, in and of itself, invalidate an impact statement.²⁶

Designation of Lead Agency

Another problem area for many submitting proposals is determining through which of several possible agencies the impact statement should be filed in those cases where the project will require a review on the part of two or more federal agencies. For example, through which agency would a construction firm file its assessment report if the construction project would require a water permit for its effluents and at the same time would destroy rare vegetation? Does it file through the Department of Housing and Urban Development or the Environmental Protection Agency or through both?

In an attempt to avoid such duplication, Section 5(b) of the Council on Environmental Quality (CEQ) Guidelines provides for the designation of a "lead agency" with the accompanying responsibility of preparing any necessary impact statements. The Guidelines define the lead agency as that federal agency which has primary authority for committing the federal government to a course of action with significant environmental impact. In addition to this definition, three other factors

²⁶Lyndon B. Johnson School of Public Affairs, p. 27.

are utilized by agencies in determining the lead agency: whichever agency became involved in the project first, whichever has the heaviest involvement, and whichever is most expert with respect to the project's environmental effects. CEQ will further aid agencies and companies in resolving questions of lead agency determination as it becomes necessary.²⁷ The Council should be contacted before any work has been begun on the assessment report.

Use of Applicant's Environmental Assessment

Operating under the guidance of the National Environmental Policy Act, several agencies require applicants to appear before them or to file an environmental assessment report to assist the agencies in achieving compliance with NEPA. This assessment report is used to determine whether or not an impact statement will be required. It may contain all of the parts previously mentioned as needed in an environmental impact statement. Appendix G is a reprint of "Instructions for Preparing Environmental Assessments for Construction Grant Projects," U.S. EPA, Region VI, and is typical of what is required by several agencies.

While in most cases the additional burden placed upon applicants is not unreasonable, the cost of meeting these

²⁷Council on Environmental Quality, Fourth Annual Report (Washington, 1973), pp. 234-236.

requirements in some instances, for example the Atomic Energy Commission (AEC), can be substantial. AEC's impact requirements states: "Each applicant for a permit to construct a nuclear power reactor . . . shall submit with his application three hundred copies (300) . . . of a separate document entitled "Applicant's Environmental Report--Construction Permit Stage"28

Appendix H shows a flow diagram for the filing of an environmental assessment report for "New Source Water Discharge Permit." This diagram was obtained from the Region VI Office of EPA and provides beneficial guidance in the preparation of the assessment report.

Although such requirements exist, the predominant court view is that the agency must serve as more than an endorsement to an applicant's assessment. The statements of the applicant cannot be taken at face value.²⁹ It may be reasonable to assume that some applicants' statements will be based on self-serving declarations designed to minimize obstacles to the final approval of their proposal.

Process for Filing an Environmental Impact Statement

Any federal agency which proposes to commit the federal government to actions with significant environmental impact is required by the National Environmental Policy Act to

²⁸Lyndon B. Johnson School of Public Affairs, p. 28. (Revised Appendix D of 1D of CRF 50.)

²⁹Ibid., p. 29.

prepare an environmental assessment of the proposed action to determine if a full EIS will be required. This assessment, which may be prepared by the agency, a permittee or contractor, identified the major effects, problems, and areas of conflict which may result from a given action. The decision as to whether or not the proposed action is of sufficient significance to warrant the preparation of a formal environmental impact statement is a highly subjective and discretionary decision made by the agency involved. Following the general guidelines advanced by the Council on Environmental Quality, each agency develops its own criteria for deciding whether or not the EIS will be prepared. The agency considers such factors as national versus regional and local importance, rareness of resources, accumulative effects of several small actions, the effect on the ecosystem, to name just a few.

On the basis of this assessment, the agency determines whether an EIS is required. If the agency feels the EIS is warranted, a draft statement,³⁰ containing the parts previously mentioned, is prepared. This draft statement must be prepared and circulated at least ninety days before initiating the proposed action. This statement is reviewed by all federal, state, and local agencies "which [have] jurisdiction by law or special expertise with respect to any environmental impact

³⁰Appendix I shows the basic format for a draft EIS and a final EIS. It should be noted that this format shows the minimum content and may be expanded to fit the needs of a specific agency.

involved."³¹ The comments obtained from this review must accompany the proposal "through the existing agency review processes" and must be made available to the public. The public and private organizations and individuals are free to comment as well. However, it should be reemphasized that only "responsible" comments need to be considered and contained within the impact statement. Agencies allow at least 30 days for comments on draft statements.

The environmental impact statement is not limited to federal agencies. Immediately after the passage of NEPA, the states in increasing numbers added the requirement for such statements by state and local agencies. The following section of this chapter will discuss state environmental impact requirements.

State Environmental Impact Requirements

Although NEPA does not apply directly to the actions, programs, and projects of state and local governments, these bodies are significantly involved in the federal EIS process. When federal funding is extended to state and local projects, an impact statement must be prepared. In addition, state and local agencies are often asked to comment on a federal impact statement. Nevertheless, many activities of local and state governments and private businesses were left uncovered by

³¹National Environmental Policy Act of 1969, Sec. 4321-4347, p. 2.

NEPA. The adoption by the states of State Environmental Policy Acts (called "little NEPAs") cover this wide range of actions that are not subject to the federal law and fills this very important void. It is felt by the CEQ officials that the "little NEPAs" may prove to be more responsive to local needs than the federal statements have been.³²

By August 1, 1974, twenty-one states and the Commonwealth of Puerto Rico had adopted environmental impact statement requirements similar to those set forth in NEPA.³³ Thirteen states--California, Connecticut, Hawaii, Indiana, Maryland, Massachusetts, Minnesota, Montana, North Carolina, South Dakota, Virginia, Washington, and Wisconsin--and Puerto Rico have legislatively adopted a comprehensive EIS requirement.³⁴ In addition, six states require preparation of impact statements on specific classes of projects. Arizona requires that impact statements be prepared for proposed water-oriented projects; Georgia and New Jersey require an environmental analysis for certain toll road projects; Nevada has a special provision relating to utility power plant siting; Nebraska Department of Roads must prepare impact statements on state-funded highway projects; and Delaware requires the preparation

³²Council on Environmental Quality, Fifth Annual Report, p. 402.

³³Ibid.

³⁴Thaddeus C. Trzyna, Environmental Impact Requirements in the States: NEPA's Offspring (Washington, 1974), pp. 7-32.

of statements in connection with the issuance of permits to manufacture.³⁵ In addition, a number of American cities, including New York City and Bowie, Maryland, have also initiated environmental impact statement programs.

Appendix J lists the states and local governments which, as of August 1, 1974, have adopted an impact statement process or have a proposal pending. At least fifteen states are now considering the establishment of impact statement requirements. To aid states in developing their environmental acts, the Council of State Governments adopted the Suggested State Environmental Policy Act (see Appendix K). One state, New Mexico, repealed its environmental impact statement requirement.

Contents of the States' Environmental Impact Statements

Most of the state acts and executive orders closely follow NEPA with respect to the required items to be discussed in the impact statements. A few states have added new elements which may increase the utility of the documents. Three elements added to NEPA's requirements by the various states are mitigation measures, growth-inducing impacts, and economic impacts.³⁶

Massachusetts narrowed the scope of the impacts to be analyzed to those relating to natural resources, while Michigan's act refers specifically "to the effects on human

³⁵Ibid.

³⁶Ibid.

life." The Minnesota EIS must include an assessment of the "impact on state government of any Federal controls associated with the proposed actions" and a discussion of the "multistate responsibilities associated with the proposed actions."³⁷

California (the first state to have such a requirement), Maryland, Massachusetts, North Carolina, and Virginia require that the EIS include a discussion of the mitigation measures proposed to minimize the impact of the project.

The Suggested State Environmental Policy Act, the California law, and the Montana act require an analysis of the "growth-inducing impact of the proposed action."³⁸ A significant addition to NEPA is the inclusion of the economic impact of proposed actions. Connecticut, Michigan, Minnesota, Montana, and Wisconsin have adopted this requirement. CEQ's guidelines specify only that an impact statement deal with "changed patterns of social and economic activities" in a discussion of the secondary consequences of a proposal.³⁹

Applicability to State, Local, and Private Projects

Just as NEPA requires impact statements from federal agencies, all of the state laws require impact statements for major actions undertaken directly by state agencies. However, the state plans differ greatly in their application to local government actions and to private activities which

³⁷ Ibid.

³⁸ Ibid.

³⁹ Ibid.

require a government permit. Because most of the important requirements governing private actions, including land use permits, are administered by local agencies, the inclusion of local governments' actions in the state EIS programs by the same token includes most businesses.

Most state laws contain provisions that statements must be prepared on actions requiring permits, licenses, etc., in much the same way as NEPA makes a similar requirement for "Federal lease, permit, license certificate or other entitlements."⁴⁰

Thus far, California is the only state which has been preparing a significant number of EIS's on private actions and actions of local governments. Because of this occurrence, the California act is receiving much attention from other states and from authors writing on the subject of NEPA. The California Supreme Court ruled in September, 1972, that an EIS must be prepared before any governmental entity approves a "private project which could have a significant effect on the environment. . . ."⁴¹

The Massachusetts act was amended in 1974 so that it applied in certain instances to "any work, project, or activity of any private person, firm or corporation which may cause damage to the environment." Washington's state guidelines

⁴⁰Council on Environmental Quality, Fifth Annual Report, p. 402.

⁴¹Trzyna, pp. 7-32.

indicate that private activities are subject to the EIS requirement. Michigan, Montana, Minnesota, and Wisconsin require that an impact statement be prepared on private activities for which a state permit is required.⁴²

Three states specifically do not apply the EIS procedure to private agencies. The Texas law applies only to the sixteen agencies comprising the Interagency Council for Natural Resources and the Environment. The Virginia law applies only to state construction projects proposed by the executive branch of the state which cost over \$100,000. Indiana's Environmental Policy Act specifically provides that it shall not be construed "to require an impact statement for the issuance of a license or permit by any agency of the state."⁴³

Many questions concerning state laws remain unanswered and as was the case with NEPA, court decisions will have to provide the answers. A study group at the University of Texas found among the unanswered questions the following:

1. How detailed must the EIS be?
2. What obligation are state and local agencies under to be guided by comments made by other agencies?
3. Who should determine which agency writes the EIS in multi-agency projects?
4. Do the environmental protections acts (federal and state) apply retroactively to projects approved before the passage of such acts?
5. How can environmental factors be quantified?⁴⁴

⁴²Ibid.

⁴³Ibid.

⁴⁴Lyndon B. Johnson School of Public Affairs, p. 78.

Studies and Opinions on NEPA and EIS's

Frank Kreith and Associates conducted a study which was published in January, 1973, to determine how effective NEPA is in achieving its objectives.⁴⁵ Using a sample of 200 drawn from the 1,100 final statements which had been filed to that date, these statements were studied to determine if any statements resulted in a proposed action being avoided or reversed.

It was found by Kreith that all of the actions that were investigated were approved by the CEQ and that in no case had adverse comments on an environmental impact draft statement resulted in the proposed project being abandoned although a majority of the statements listed adverse environmental effects that they claimed could not be avoided.

On the 127 actions which listed adverse environmental effects, 214 alternatives were given; all were rejected for either economics, environmental, or engineering reasons. The EPA was requested to comment fifty-six times and approved all the proposed actions. In twenty-four instances the EPA made no comment at all or did not reply, and only in five instances did it make suggestions for improving the proposed action.

An interview conducted with the Environmental Protection Agency, Region VI, on July 21, 1975, revealed that the results would have been the same in this region, that is, the NEPA

⁴⁵ Frank Kreith, "Lack of Impact," Environment, XV (January-February, 1973), 26-33.

Environmental Impact Statement process resulted in a few changes within projects but not the rejections of the projects themselves.⁴⁶

On the other side of the coin, the Council on Environmental Quality makes mention of cases where the EIS process has resulted in major changes or elimination of projects. Although no statistics as to the prevalence of these changes were given by the CEQ, a few cases taken from their annual reports may serve as examples.

According to CEQ, the Secretary of the Interior in 1971 refused, on environmental grounds, to authorize two proposed platforms on existing oil leases in the Santa Barbara Channel. The San Francisco new rapid transit system was denied a permit because of its effect on the environment, and Interstate 75 in Georgia was given a new alignment to minimize the adverse effects on Allatoona Lake and its surroundings.

Two factors should be borne in mind in weighing the two sides of the picture presented above:

1. Kreith's study was published in January, 1973, and cover statements filed between January 1, 1970, and December, 1972. This was the time period when many agencies had not yet clearly defined their guidelines and policies in the area of scope and depth of the contents.

⁴⁶Personal interview with Kenneth Holmes, Environmental Protection Specialist, Dallas, Texas, July 21, 1975.

2. The cases cited by the CEQ were not reported as being representative of a sample nor a population. They were isolated cases selected to serve a particular purpose. It should also be taken into consideration that a refinement in agency guidelines have in some cases resulted in more stringent standards, and as a result, may have caused more alterations in the projects proposed if submitted at a later date.

Summary

The requirement that Environmental Impact Statements must be filed by federal agencies in connection with every major effort which significantly affects the environment has been one of the most widely discussed requirements ever set forth by the federal government.

The very wording of the National Environmental Policy Act and the guidelines set forth by the Council on Environmental Quality has made it very difficult for agencies and businesses to comply with the letter of this law. As a result, almost every section of NEPA and the CEQ guidelines has been tested in the courts. The decisions and interpretations given by the courts are resulting in very stringent requirements. As required by NEPA, the various federal agencies have established their own specific requirements for the filing of the statement. In addition, some twenty-one states and at least two cities have passed "little NEPAs" which extended the coverage to local agencies and private

actions. The state laws differ but are patterned after NEPA. There is a definite indication that the remaining twenty-nine states will initiate some type of environmental review action for projects under their jurisdictions. As different federal agencies and the various states have different requirements, one should review guidelines published by the particular agency or state to assure that the requirements are being adequately met.

The impact of NEPA has received opposing opinions. A study by Kreith indicates that the EIS process is not serving NEPA's purposes. This study found that out of the 200 impact statements reviewed, no major changes were required. The Council on Environmental Quality feels that the EIS and NEPA, along with the state requirements, are well underway to keeping tabs on the environment.

It is evident that by analyzing all of the areas that are necessary to file a "full disclosure" EIS, better decision-making will result on the part of federal, state, and local governments and by private concerns.

CHAPTER IV

THE ECONOMICS OF ENVIRONMENTAL MANAGEMENT

Introduction

In the free enterprise system in operation in America today, businessmen have been trained to expect to reap benefits from efforts extended--to maximize return on investments. As such, one of the areas of greatest concern to businessmen is the cost-benefit ratio or pollution abatement efforts.

What does it cost American businessmen to live within a clean environment? Can a businessman accurately estimate the costs and benefits allowed to pollution control? How can a business finance the costs of pollution control equipment? The purpose of this chapter is to investigate questions of this nature.

The Economic Impact of Pollution Control Efforts

Types of Costs

Economists feel that any good or service, whether a new appliance or a cleaner environment, costs something. There are several different types of costs related to pollution control, and the costs are often born by different people; nevertheless, they must be paid. Anyone attempting to identify and balance costs in environmental decision-making must analyze at least the four costs discussed below.

Damage costs.--Damage costs are those costs which result from a polluting activity, for example, emphysema resulting from air pollution or the inhalation of coal dust.¹ Damage costs include damage to health, to vegetation, and to materials; the costs of repairing such damages; the destruction of ecosystems; and the loss of aesthetic, recreational, and other environmental amenities. These tangible costs are the costs most estimated and reported as pollution damage costs, and they are usually measured in terms of the marketplace value of the resources destroyed or consumed.²

In addition to these tangible costs, there are various intangible damage costs--the anxiety caused by congestion, the eyesore caused by a strip development, the annoyance of excessive noise. Often called psychic or social costs,³ these costs embrace the range of annoyance and other psychological costs associated with environmental degradation beyond the value of any physical resources damaged. Often these psychic costs are matters of preference, and their importance is often underestimated by the marketplace. They are rarely included in damage estimates as they cannot be accurately quantified. In addition, as is true of most costs, they change over time.⁴

¹Council on Environmental Quality, Fifth Annual Report (Washington, 1974), p. 74.

²Ibid.

³Laurent Hodges, Environmental Pollution (New York, 1973), p. 306.

⁴Ibid.

Avoidance costs.--Avoidance costs are those costs that people incur in order to avoid or reduce damage costs,⁵ for example, the cost of driving farther to find an unpolluted beach or moving to the suburbs to avoid the inner city traffic. The cost of treating intake water to prevent damage from occurring is a common industrial avoidance cost.

Avoidance costs are often ignored because they are generally very hard to estimate. In most cases the action is taken for several reasons, only one of which is to avoid pollution. Present techniques are not sophisticated enough to accurately estimate what proportion of the cost was incurred to avoid pollution and what portion was incurred for other reasons.⁶

Transaction costs.--Transaction costs represent the resources consumed in making and enforcing policies and regulations,⁷ such as the cost of preparing and filing an impact statement.

The costs of research, development, planning, monitoring, and enforcement needed to achieve environmental goals and a large portion of federal expenditures on environmental programs are for transaction costs. Emissions and effluents

⁵Council on Environmental Quality, Fifth Annual Report, p. 76.

⁶Council on Environmental Quality, Fifth Annual Report, p. 83-84.

⁷Ibid.

from factories and other point sources⁸ must also be monitored. There are some 70,000 to 100,000 major air pollution point sources and a single measurement and analysis of the emission from any one of the point sources can cost up to \$5,000.⁹ Although current federal law¹⁰ requires self-monitoring by polluters, substantial monitoring still must be conducted by the government. These costs, as well as the cost of planning and administration, will have to be paid by state and local governments.

Abatement costs.--Abatement costs are those associated with reducing the amount of environmental degradation. A complete definition of abatement costs would include non-cash cost as well as cash expenditures required to reduce contaminants. It would also cover adjustments for items such as by-products revenues, productivity changes, financing methods, and tax payment. These are the costs which are thought to be most accurately estimated.¹¹

1. Air pollution abatement costs.--As early as December, 1966, Allen Kneese of Resources for the Future charged that estimates of the costs of air pollution were

⁸See Definition of Terms, Chapter I, p. 12.

⁹Council on Environmental Quality, Fifth Annual Report, p. 83.

¹⁰See the Federal Water Pollution Control Act of 1970.

¹¹These costs would more accurately be termed gross abatement expenditures because the relevant deductions are not made.

indefensible guesses and should be abandoned.¹² Basically, measurement of the costs of air pollution suffers from the inability to determine precisely the effects of different kinds and levels of pollutants upon such varied objects as vegetation and air traffic. And in those cases where cause and effect can be determined, a further stumbling block is the absence of widespread monitoring devices to measure the presence of various kinds of air pollutants.

In conceding that the cost in investment and operations for adequate controls cannot be answered very accurately, several studies have been conducted to provide estimates. The Council on Environmental Quality estimated the total air pollution costs in the United States at \$16 billion annually, which amounts to approximately \$80 per person in the country.¹³ Lave and Seskin¹⁴ attempted to determine the medical costs of air pollution and estimated that a 50 per cent reduction in air pollution levels in major urban areas would save \$2.08 billion annually in terms of decreased mortality and morbidity or 4.5 per cent of all economic costs associated with mortality and morbidity.

¹²Allen V. Kneese, Environmental Quality Analysis (Baltimore, 1972), p. 11-12.

¹³Council on Environmental Quality, Fifth Annual Report, p. 106.

¹⁴Cited by Lawrence G. Hines, Environmental Issues--Population, Pollution, and Economics (New York, 1973), p. 285.

The Council further estimated that the total annual cost of air pollution abatement would be \$4.7 billion by 1975.¹⁵ This estimate includes capital investment, interest, operations, and maintenance. It estimates, on the other hand, that the economic losses that this program will prevent will total at least \$16 billion annually.¹⁶ This amounts to a cost-benefit ratio of roughly 3 to 1.

2. Water pollution abatement costs.--The costs of water pollution are probably even more difficult to estimate than the costs of air pollution. Who can measure and quantify the "aesthetic" or social costs of a polluted beach or a "smoggy" sunset? Hodges questions whether it is even valid to try to express these costs in monetary terms.¹⁷

An official estimate by the Council on Environmental Quality sets \$121.3 billion as the price for cleaning up the United States' water over the next ten years.¹⁸ The total annualized costs (i.e., costs of capital investment, operation, and maintenance) to meet federal water quality standards were estimated at \$5.8 billion annually in 1975. This amounts to about \$25 per person. Siguard Grava¹⁹ has estimated that \$100-110 billion will be required by the year 2000 to obtain

¹⁵Ibid.

¹⁶Ibid.

¹⁷Hodges, p. 138.

¹⁸Council on Environmental Quality, Fifth Annual Report, p. 107.

¹⁹Ibid.

adequate secondary treatment plants for domestic and industrial waste waters. This amounts to nearly \$4 billion in annual expenditures. Secondary treatment has been defined in Chapter I under Definition of Terms.

3. Solid waste abatement costs.--The psychic costs of solid wastes present a tremendous problem to the American populace. Most disposal methods involve some aesthetic displeasure. In rare circumstances the costs can be much higher. Hodges reports that approximately 145 children were killed in Wales on October 21, 1966, when an avalanche of two million tons of coal wastes buried a school and several cottages.²⁰

The major cost of solid waste disposal in the United States at present comes from the collection, transportation, and transfer of the wastes, not from the final states of disposal. The National Solid Wastes Survey²¹ estimates that the average per capita annual expense for all communities was \$6.81 of which \$5.39 was for collection and \$1.42 for disposal. This survey showed that 80 per cent of total expense is for collection and only 20 per cent for final disposal, which demonstrated the emphasis on collection services and the neglect of research and innovation in proper disposal practices by private and public organizations.

²⁰Hodges, p. 218.

²¹Hodges, p. 219.

The 1970 cost of solid waste management problems in the United States was estimated by the Council on Environmental Quality as \$5.7 billion or about \$27 per person annually. The Council estimated that in order to satisfy federal environmental standards, the 1975 annualized costs would have to be \$7.8 billion or a 37 per cent increase over the 1970 costs.²²

Table III shows the estimated total pollution control expenditures for the 1973-1982 decade as provided by the CEQ. Appendix N shows the estimated incremental pollution control expenditures. The incremental costs are expenditures made pursuant to federal environmental legislation, beyond those that would have been made in the absence of current legislation.

The Effects of Pollution Control Costs on Selected Industries

This section of Chapter IV deals with the economic impacts of air and water pollution abatement requirements on a number of selected industries. The industries (electric utilities, pulp and paper, petroleum refineries, aluminum smelters, iron foundries, copper smelters, cement, and leather tanneries) were chosen because pollution control and abatement assumes larger than average dimensions for them. Most of the executives in these industries, according to the

²²Council on Environmental Quality, Fifth Annual Report, p. 118.

TABLE III
ESTIMATED TOTAL POLLUTION CONTROL EXPENDITURES
(In billions of 1973 dollars)

Pollutant/Medium	1973		
	O&M ¹	Capital Costs ²	Total Annual Costs ³
Air Pollution			
Public	0.1	0.1	0.2
Private			
Mobile	1.2	0.2	1.4
Stationary	1.1	1.1	2.2
Total	2.4	1.4	3.8
Water Pollution			
Public			
Federal	0.2	NA	NA
State and local	1.4	4.1	5.4
Private			
Industrial	0.9	1.1	2.0
Utilities	NA	NA	0.01
Total	2.5	5.2	7.4
Noise	NA	0.1	NA
Radiation			
Nuclear power plants	NA	NA	NA
Solid Waste			
Public	1.1	0.3	1.4
Private	1.9	0.05	1.9
Total	3.0	0.3	3.3
Land Reclamation			
Surface mining	0.3	0.0	0.3
Grand Total	8.2	6.9	14.8

¹Operating and maintenance costs

²Interest and depreciation

³Operating and maintenance costs plus capital costs

1982			Cumulative--1973-82		
O&M ¹	Capital Costs ²	Total Annual Costs ³	Capital Investment	O&M ¹	Total Annual Costs ³
0.1	0.2	0.7	1.7	3.8	5.4
8.4	4.9	13.3	31.3	49.9	74.4
4.7	3.1	7.9	21.4	35.3	62.6
13.6	8.2	21.9	54.4	89.0	142.4
0.2	NA	NA	1.8	NA	NA
4.2	8.3	12.5	50.6	27.4	88.5
2.8	2.2	5.0	16.5	21.6	40.4
0.4	0.3	0.7	4.4	2.2	3.5
7.6	10.8	18.2	73.3	51.2	132.4
NA	1.0-1.4	NA	6.0-8.7	NA	NA
0.05	0.05	0.07	0.3	0.08	0.3
1.9	0.5	2.4	4.2	15.5	19.3
3.0	0.1	3.1	0.4	25.2	25.6
4.9	0.6	5.5	4.6	40.7	44.9
0.6	0.0	0.6	0.0	5.0	5.0
26.7	19.7	46.3	132.6	185.9	325.0

study by Pfeiffer and Gilbert²³ fear that new legislation, regulations, and costs are being introduced at a pace which exceeds the growth of scientific knowledge of pollution. The data used in this section are based on the following three studies:

1. Council on Environmental Quality, Department of Commerce, and Environmental Protection Agency, "The Economic Impact of Pollution Control."

2. Brant A. Pfeiffer and Ronald D. Gilbert, "Pollution Abatement Expenditures by the Electric Power Industry," reported in Public Utilities Fortnightly, August, 1972.

3. John H. Watson II, "Approaches to Abatement in Five Major Industries," reported in Conference Record Board, May, 1967.

Individual citations are not used for the numerous figures used.

In general the studies found that none of the industries studied would be severely impacted in that the long-run viability of no industry is seriously threatened solely by the pollution abatement costs estimated. However, profits will decline for some firms in most of these industries because the firms will not be able to pass on the full cost of pollution abatement to consumers in the form of higher prices. The costs will not be borne by the consumers because

²³Brant A. Pfeiffer and Ronald D. Gilbert, "Pollution Abatement Expenditures by the Electric Power Industry," Public Utilities Fortnightly, XC (August, 1972), 21.

substitute products are available to them. Accordingly, some firms will earn lower profits, some will curtail production, and some firms and plants will be forced to close. See Appendix L for a full discussion of the impact on individual industries. See Table IV for tabular summary of the economic impact on selected industries.

Most of the firms or plants that will be forced to close are currently marginal operations²⁴ that were already having economic hardships due to other competitive factors. In such cases, environmental standards only served to accelerate the closings that in all probability would have occurred anyway.

Of the 12,000 plants operating in the industries studied, approximately 800 were expected to close in the normal course of business between 1972 and 1976. The studies estimated that an additional 200 to 300 plants will be forced to close because of pollution abatement requirements.

These plant closings and production decreases will have both direct and indirect impacts. The direct impacts include the loss of jobs and reduced value of equity. An indirect impact is that related firms will be forced to close or reduce production. Another indirect impact is that the communities where such plants are located may suffer local recessions--especially in the small, rural, one-plant towns.

²⁴Marginal operations is defined as the smaller, older, less efficient producers.

TABLE IV
ECONOMIC IMPACT OF POLLUTION ABATEMENT COSTS ON SELECTED INDUSTRIES, 1972-76

Industry	Capital Investment	Annual Cost in 1976	Plants Closed	Jobs Lost	Added Cost to Customers
Electric utilities	\$10.7 billion	\$2.5 billion	None	None	7%
Pulp and paper	\$ 3.3 billion	\$5.50-12.50 per ton	90 to 100	16,000	3.5% to 10%
Petroleum refineries	\$634 million to 1.1 billion	\$21 million	12	1,000	8¢ a barrel
Aluminum smelters	\$935 million	\$290 million	None	None	5% to 8%
Iron foundries	\$348 million	\$125 million	400 by 1980	8,000 by 1980	1.7% to 5%
Copper smelters	\$341 million	\$ 95 million	2	1,150	2.5% per pound
Cement	\$122 million	\$ 43 million	25	?	4% to 5%
Leather tanneries	\$ 89 million	\$10.7 million	?	600	1% to 2%

The studies suggested that direct job loss attributable to environmental regulations in the affected industry activities examined may range from 50,000 to 125,000 jobs over the 1972-76 period. While the total plant closings in the industries in which plant closings might have a community impact appear to be about 150, the data was not in sufficient detail to determine the exact number which would be significantly impacted. In interpreting Table IV and findings reported in Appendix L, it is important to be aware of the definitions and assumptions used in arriving at them.

Definitions and Assumptions

The investment costs of pollution control equipment were defined to include the direct incremental investment required to attain environmental standards (1) for existing facilities and (2) for new facilities. The operating costs for pollution control equipment were defined to be incremental and net of any productivity increases or by-product revenues.

The water cost data were estimated under the assumption that the relevant standard is best practicable treatment--roughly equivalent of industrial secondary treatment. The air cost data were estimated under the assumption that the same set of emission standards would apply in every state. The standards assumed were those published by EPA in the "Guidelines for Developing State Implementation Plans."

For the purpose of these studies, it was assumed that all pollution abatement costs for existing plants and for those to be completed by 1976 would be incurred by 1976.

Knowing the costs incurred as indicated in Tables III and IV are only one side of the pollution "coin," these costs must be financed and financed within very short periods of time. What methods of financing are available to businesses?

Means of Financing the Costs of Pollution Abatement

Financial experts are presently investigating industrial revenue bonds and leveraged leasing as two types of financing to lower the long-term money costs for users of pollution control and abatement equipment.

United States Steel Corporation in 1971 floated the first industrial revenue bond to finance pollution control equipment, and as a result of the tax exemption saved more than \$1 million in interest.²⁵ Thayer estimates that by 1980 at least 25 per cent of the money spent on pollution control equipment will come from this source.²⁶

Thayer further alludes to the fact that leveraged leasing has provided the financing for more than \$5 billion in capital equipment. Under the leveraged lease transaction, the lessee of the facility makes substantially lower cash lease rental

²⁵Donovan S. Thayer, "Financing Pollution Control," Credit and Finance Management (November, 1973), pp. 28.

²⁶Ibid., p. 28.

payments to the owner over the life of the lease due to the owner's ability to include the benefits of non-cash deductions on his income tax returns.

Industrial Revenue Bonds

In 1968 the United States Congress passed the Revenue and Expenditure Control Act which authorized the unlimited use of tax-exempt industrial revenue bond financing if the issues were to be used to finance air and water pollution control facilities. Typically, a city, county, or state issues bonds, uses the proceeds to build pollution control facilities and then leases the facility to a corporation at a rental rate sufficient to cover the interest and face amount of the bonds. These bonds are payable solely from lease payments of the corporation.

According to Donovan D. Thayer, founder and president of IteL Leasing Corporation, the advantages of the industrial revenue bonds are:

1. The bond issue will carry a lower interest rate, reflecting the fact that the interest is exempt from federal and some state and local taxes.
2. The purchase is, in some instances, exempt from state sale taxes.
3. Often the obligation of the corporation securing the industrial revenue bonds will not be restricted by any outstanding indentures.
4. The bonds are sold in the tax exempt municipal bond market. This decreases the volume of direct debt to be sold in the corporate bond market by a corporation facing a heavy capital expenditure or refunding schedule.

5. It has usually been possible to market industrial revenue bonds without incurring any restriction on other forms of borrowings by the corporation or other negative pledge covenants.²⁷

Leveraged Leasing

In a leveraged lease transaction, equipment ordered by the lessee is purchased by the lessor who leases it to the lessee for most of the equipment's life. The purchase is made by the lessor by making a down payment (not less than 20 per cent) and borrowing the balance from institutional lenders. The equipment itself serves as the debt security.

The lessor has advanced only a portion of the total equipment cost but is nevertheless considered for tax purposes to be the sole owner of the equipment. He receives a substantial portion of rate of return for the transaction from the tax benefits. He shares these benefits with the lessee in the form of reduced lease rentals. Because of the sharing of tax benefits by the lessor/owner, the lessee can obtain an annual interest cost must lower than the prevailing long-term debt cost from private institutions. Thayer enumerates the following advantages for leveraged leasing:

1. The lessee can acquire the use of the necessary equipment for terms approximating the useful life of such equipment at fixed rental charges substantially lower than prevailing long-term debt costs.
2. The lease transaction can be structured so progress payments, delivery and installation charges, and extras are part of the lease, thus conserving capital.

²⁷Ibid., p. 19.

3. A true lease also offers considerable benefits from a tax timing standpoint. The lessee treats the rentals as a fully deductible, current business operating expense, thus reducing the net cost to the lessee by a percentage equal to the lessee's tax bracket.
4. Leasing is more convenient. Documentation is far more flexible and less costly than that required for other debt and equity source financing.²⁸

In 1973 the United States Small Business Administration (SBA) conducted an in-depth study to determine what costs and other problems will be involved for small businesses in complying with new antipollution laws. As a part of this study, several ways of financial pollution control costs for small businesses were explored: (1) direct loans, (2) guaranteed loans, and (3) "possible financing under the Lease Guarantee Program."²⁹ The Lease Guarantee Program was not put into effect.

The following advantages were given by the Small Business Administration for the use of direct loans: (1) low interest rates, (2) long terms, and (3) inclusion of marginal small businesses.³⁰ The SBA felt that disadvantages may stem from the lack of funding availability and the drain on SBA personnel and budget.

Advantages of the guaranteed loans are: (1) minimal budget expenditures, and (2) private sector participation.³¹

²⁸Ibid., p. 30.

²⁹"Study Seeks to Cushion Cost Impact of Pollution Fight on Small Firms," Commerce Today (April 2, 1973), 10-11.

³⁰Ibid., p. 10.

³¹Ibid., p. 10.

The disadvantages of the guaranteed loans are higher interest rate, shorter term, and the exclusion of marginal small businesses. Marginal businesses were defined by Lawrence W. Griffin as "those businesses that would be high credit risks in the private sector."³² Firms requiring financial assistance to comply with pollution standards should apply to SBA for loans through the agency's regular business loan program. Under this program, SBA may guarantee up to \$350,000 or 90 per cent, whichever is less, of a loan a bank makes. It may also lend up to \$150,000 in participation with a bank if the bank furnishes at least 25 per cent of the total, and it may (depending on availability of funding) lend up to \$100,000 on a direct loan to a small firm. A recent interview with a SBA official revealed that funds are in short supply during the present quarter.

The loans may be for as long as ten years--fifteen years for construction of facilities--and the interest rate on a direct loan is 6.58 per cent. It should be noted that this rate fluctuates on a quarterly basis depending on the nature of "governmental transactions."³³ The maximum rate on a guaranteed bank loan is 10.25 per cent.³⁴

SBA is able to provide financial aid for small firms required to meet the standards established under the Federal

³²Interview with Lawrence W. Griffin, Loan Officer, Dallas SBA District Office, Dallas, Texas, September 22, 1975.

³³Ibid.

³⁴Ibid.

Water Pollution Control Act. Congress has authorized \$800 million for this purpose. There are no dollar limits on these loans, and they may be for as long as thirty years. SBA may provide up to 90 per cent of a participation loan with a bank, or guarantee 90 per cent of a loan a bank makes. However, SBA's preference is for a 100 per cent bank loan.

A potential borrower firm must be classified as a small business³⁵ and must prove the likelihood of economic injury caused by a requirement to meet federal standards.

Summary

That certain pollution abatement activities must be carried out is a part of the law of the land. And as such, businessmen must comply with them. This is not an easy task from either a technological or a financial viewpoint.

From the financial viewpoint the costs of abating air, water, and waste pollution soar exponentially as new levels of controls are instituted. To complicate the matter further, these costs are generally borne by industry and ultimately the consumer, while the benefits are reaped by the society at large. Where do the businessman's responsibilities end?

Although not in large numbers, the very cost of pollution abatement is causing marginal businesses to shut down operations, and in other businesses, unemployment of the workers is the result.

³⁵SBA defines a small business as follows: Retail and Service Industries with annual receipts up to \$2,000,000; Wholesalers, up to \$9,500,000 annual receipts; and Manufacturers, up to \$250,000,000 annual receipts.

Several methods of financing are available to businesses: (1) industrial revenue bonds, (2) leveraged leasing, (3) direct and guaranteed loans from the Small Business Administration.

Chapter V presents a discussion of the pollution abatement efforts of selected businesses in Environmental Protection Agency Region VI which includes the states of Texas, Louisiana, Oklahoma, Arkansas, and New Mexico.

CHAPTER V

COMPLIANCE EFFORTS OF SELECTED BUSINESSES IN
ENVIRONMENTAL PROTECTION AGENCY REGION VI

Introduction

The discussion in Chapter IV centered around the economic aspects of environmental management on the nation and on broad industrial categories. Of more potential use to an individual business firm is a look at the costs and problems that have been encountered by other businesses. In order to provide businesses with such data, a survey of eighteen businesses located in the Environmental Protection Agency's Region VI-- Texas, Louisiana, Arkansas, Oklahoma, and New Mexico--was conducted. The mailing list was supplied by Kenneth Holmes, Environmental Specialist, Environmental Protection Agency, Region VI, and consisted of all businesses that had applied for "new source water permits." These businesses either had filed an environmental assessment report or were expected to be in the process of filing the report.

The eighteen companies operate in the chemical, petroleum, electric utilities, gas utilities, and food processing industries. As noted in Chapter IV, all of these industries are among the heaviest polluting industries and are expected to receive much attention from the Environmental Protection Agency.

The companies vary in size from small to large as measured by reported capital; the net sales in 1974 range from a high of \$18,929,033,000 to a low of \$145,760,000. Data from Standard and Poors show that several of the companies issued "pollution control bonds" in 1974 as a means of financing the abatement efforts. All of the companies are in such industries that the cost of pollution control efforts can be passed on directly to the final consumers.

A questionnaire, a copy of which is shown in Appendix M, was mailed to the eighteen businesses. Eight businesses responded by mail; an additional four businesses responded as a result of a telephone follow-up effort. This brought the total number of respondents to twelve or 66.6 per cent. The information obtained from this survey is presented in this chapter.

Analysis of the Data

The first area of concern queried was which of the many environmental laws has proven to be the most difficult with which to comply. Responding companies found that the air pollution laws have been most difficult for them to achieve compliance. Comments indicated that adequate measurement techniques were not always available and that the Environmental Protection Agency did not always provide the kind of information that was needed by the businesses.

Specifically, the Clean Air Act Amendments of 1970 and the Federal Water Pollution Control Act were the laws that required the addition of new equipment. It is suspected that since there is such a close similarity between the answers to the question "which law was most difficult with which to achieve compliance" and the question "which law required the addition of new equipment," that the difficulty factor was perceived by the businessmen in relationship to the need to modify or add to the company's existing equipment.

Table V below shows the federal laws most difficult for companies to achieve compliance, and Table VI shows the laws requiring the companies to add new equipment.

TABLE V
MOST DIFFICULT LAWS FOR COMPLIANCE

Laws	Number of Companies	Per Cent* of Companies
Air pollution laws	8	66.7
Water pollution laws	5	41.6
Solid waste management laws	1	8.3

*The percentage exceeds 100 per cent because several companies gave multiple responses.

In response to the question "were you required under any environmental laws to add new equipment or to replace old equipment" all of the respondents answered yes. Table VI

shows the general type of laws which required the addition of new equipment or the modification of old equipment.

TABLE VI
ENVIRONMENTAL LAWS REQUIRING THE ADDITION
OF NEW EQUIPMENT

Laws	Number of Companies	Per Cent* of Companies
The Clean Air Act Amendments of 1970	7	58.3
Federal Water Pollution Control Act	5	41.6
No response	1	8.3

*The percentage exceeds 100 per cent because several companies gave multiple responses.

As shown by Table VII the administrative and capital costs of environmental pollution control and abatement ranged from a low of \$300,000 to a high of \$10,000,000. These costs included the cost of adding new equipment or modifying old equipment and the costs of administering the pollution programs. When taken as a percentage of sales, the costs of controlling pollution was less than one per cent. Although the raw figures appear extremely large, the percentage of sales indicate that at least for the large businesses, the cost of controlling pollution would not seriously affect the financial postures.

TABLE VII
 ADMINISTRATIVE AND CAPITAL COSTS OF COMPLIANCE
 WITH ENVIRONMENTAL LAWS

Company	Net Sales, 1974	Compliance Costs	Percent of Sales
1	\$18,929,033,000	\$10,000,000	.052
2	7,633,455,000	8,000,000	.105
3	4,938,483,000	6,834,000	.140
4	3,497,900,000	6,000,000	.172
5	1,726,000,000	5,420,000	.314
6	4,680,000
7	2,317,683,000	4,160,000	.179
8	1,670,000
9	223,595,000	930,000	.416
10	226,954,000	900,000	.397
11	143,760,000	762,000	.530
12	175,647,000	300,000	.170

All of the respondents have filed or are now in the process of filing assessment reports. This response was expected because, as indicated above, all of the companies questioned have filed for a National Pollutant Discharge Elimination System permit and would be required to file an assessment report before beginning new operations. One of the companies indicated that in addition to being required to file the Environmental Protection Agency's assessment report, it was also required to file an environmental report with the Nuclear Regulatory Commission.

Table VIII shows responses to the question "how much time did your company spend in the preparation of the assessment or impact statement?".

TABLE VIII

TIME SPENT IN PREPARATION OF ASSESSMENT STATEMENT

Length of Time	Number of Companies
0 to three months	1
three to six months	1
six to nine months	2
nine to twelve months*	7
more than twelve months**	1

*One company indicated that it is in the process of filing the statement but expected to take about fifteen months to complete it.

**This company took eighteen months.

On the average, it took the companies nine months or more to prepare the assessment reports. Comments indicated that three factors contributed to the length of time required: (1) lack of understanding or misunderstanding of the requirements and coverage of the statement, (2) lack of needed records, and (3) records in such form that specific data could not be drawn from them.

When asked "who prepared the assessment report" the companies responded as shown in Table IX. Consultants were called in to assist in the preparation of the assessment reports by eleven of the twelve responding companies. It is believed that either the companies could not assemble a

TABLE IX
PERSONNEL WHO PREPARED ASSESSMENT REPORTS

Personnel	Number of Companies	Per Cent of Companies
Company personnel	1	8.3
Consultants	8	66.7
Company personnel and consultants	3	25.0

full-time staff of environmental experts before the assessment report had to be filed, or that the company only needed environmental experts on a consultatory basis. Only one company indicated that it used company personnel exclusively.

The companies were asked "how were the consultants obtained?". They responded as shown in Table X. A possible fruitful source, industry conferences, was almost untapped.

TABLE X
SOURCES OF CONSULTANTS

Source	Number of Companies	Per Cent* of Companies
Recommended by EPA	0	0.0
Personnel contacts	12	100.0
Industry conferences and contacts	1	8.3

*The total percentage exceeds 100 per cent because one company indicated two sources.

When consultants were hired, they were assigned from 50 per cent to 100 per cent of the task of preparing the report. In the majority of the cases, the full task of preparing the report was assigned to the consultants. A distribution of the percentages is shown in Table XI.

TABLE XI
CONSULTANTS UTILIZATION IN THE PREPARATION
OF IMPACT STATEMENTS

Percentage Used	Number of Companies	Number of Companies
0 - 75	2	16.6
75 - 100	10	83.3

Eleven of the twelve responding companies did not give an estimate of the administrative costs required to file the Environmental Protection Agency's assessment report. The one company who responded estimated its costs at \$1,000,000 over a two-year period.

The estimated costs of compliance with federal and state environmental laws in 1976 and 1980 as given by individual companies are shown in Table XII. Of the companies that were able to estimate, there was a substantial jump in the estimate for 1980 over the estimate for 1976. This could be an indication that companies are expecting more stringent requirements to be legislated.

TABLE XII
ESTIMATED COST OF COMPLIANCE WITH ENVIRONMENTAL
LAWS IN 1976 AND 1980

Company	1976	1980
1	\$ 2,000,000	\$100,000,000
2	2,000,000	3,000,000
3	1,500,000	No Estimate
4	3,000,000	5,000,000
5	3,600,000	8,350,000
6	10,000,000	No Estimate
7	34,000,000	No Estimate

Only seven companies responded to this question.

In response to the question "were any new organizational structure arrangements made to facilitate the filing of the assessment report or in other abatement efforts," all of the responding companies stated that they made at least some minor modifications in the previously existing structure. In only two instances were new positions created. Other data indicate that those responsible for environmental affairs are located in the upper management positions. This is significant for two reasons. First, it shows the importance accorded the environmental activities by companies, and secondly, it aids in getting the needed organizational support. See Table XIII.

TABLE XIII
NEW STRUCTURAL ARRANGEMENTS FOR COMPLIANCE

Structural Arrangement	Number* of Companies	Per Cent of Companies
Committees	3	25.0
Project structure	0	0.0
New position created	2	16.7
New personnel hired	5	41.7
Expansion of existing position	4	33.3

*Several companies gave multiple responses. Twelve companies responded.

Summary

The findings from the survey of the eighteen businesses located in EPA's Region VI are summarized as follows:

1. The Clean Air Act Amendments of 1970 was the environmental law most difficult with which to comply.
2. All of the companies were required to make modifications in the old equipment or to add new equipment to their existing facilities.
3. All of the companies had filed or are now in the process of filing environmental assessment reports.
4. An average of nine months was spent in preparing the assessment reports.
5. Consultants did the major portion of the work necessary for the filing of the assessment reports.

6. As a whole, companies were unable to estimate the cost of preparing the assessment reports.

7. Companies expect a substantial jump in the cost of compliance with environmental laws in 1976 and 1980. This jump cannot be accounted for solely by inflation.

8. Adjustments were made in structural arrangements by all responding companies.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

In the past decade acts passed by the federal, state, and local governments have stimulated a concerted effort in the nation aimed at the improvement of the physical environmental in which Americans live and work. These laws have been and are being passed at such a rate that it is increasingly difficult for businessmen to keep abreast even with those portions of the laws which directly affect their corporate performances. Although there are many new laws, the federal legislation aimed at the control of the environment dates back to the Refuse Act of 1899 which prohibited discharges into navigable rivers. Eleven additional laws have been passed to control water pollution, eight laws which control air pollution, and three laws which control solid waste.

More stringent requirements and standards are introduced with the passage of each new law. Businessmen and other professionals argue that new pollution control technology cannot keep pace. The professionals also question whether the laws are given ample time to work.

The laws were originally aimed at the protection of humans; they have been extended to cover wildlife and vegetation and the preservation of resources for future generations.

Perhaps the most controversial of the laws is the National Environmental Policy Act which requires that environmental impact statements be prepared and filed by all federal agencies in connection with every major effort which significantly affects the environment.

The language of both the National Environmental Policy Act and the guidelines written by the Council on Environmental Quality make it difficult for agencies and businesses to comply with the letter of the law. As a result, most sections of the National Environmental Policy Act and the Council on Environmental Quality guidelines have been tested in the courts. The courts have basically used the strict interpretation of the law in favor of the agency so as to give the agency wider jurisdiction.

As required by NEPA, the various federal agencies have established their own specific requirements and guidelines for the filing of the impact statements. In addition, some twenty-one states and at least two cities extended coverage to local agencies and private actions. The state laws differ one from another but all of them are patterned after the National Environmental Policy Act. There is a definite indication that the remaining twenty-nine states will initiate

some type of environmental review action for projects under their jurisdictions. As far as businesses are concerned, the most significant addition contributed by the state laws was the requirement that state impact statements be written on private and business activities. This means, in essence, that in states that have passed the "little NEPAs" very few, if any, businesses can escape the requirements. And, as such, expertise must be developed in this area.

A study of 200 impact statements by Kreith and associates indicates that the Environmental Impact Statement process is not serving its intended purposes. This study found that of the 200 statements reviewed, no major changes in proposed programs were required by the reviewing agencies. Officials of the EPA Region VI had the same opinion. On the other hand, the Council on Environmental Quality feels that the "EIS" process, along with the state requirements, are making considerable strides in keeping the environmental pollution in check.

From the financial viewpoint, the costs of abating air, water, and waste pollution soar exponentially as new levels of controls are instituted. Many of the costs are passed on to the consumer or are absorbed directly by industry, while the benefits are reaped by the society as a whole. The question remains whether the federal government is carrying an adequate share of the financial responsibilities involved. Businessmen think not.

When taken as a percentage of the total of all businesses, few businesses are being shut down because of the requirement to control and abate pollution. However, many weak, marginal businesses are being forced to shut down operations. As a number of these marginal businesses operate in one-industry towns, the resulting unemployment may be paralyzing.

Several methods of financing are available to businesses needing outside assistance: (1) industrial revenue bonds, (2) leveraged leasing, (3) direct and guaranteed loans from the Small Business Administration. Compositely, these financing methods may offer the advantages of lower interest rates, exemption from state sales taxes, no restrictions on other obligations, long terms, minimal budget expenditures, and the inclusion of marginal small businesses.

A survey of businesses in EPA Region VI revealed that the Clean Air Act Amendments of 1970 was the law most difficult for these businesses to meet compliance. Structural modifications and the addition of new equipment or the modification of old equipment was common among the businesses. In the filing of the assessment reports, consultants located by personal contacts were used in considerable amounts. These companies also estimate a substantial jump in the cost of compliance with environmental laws by 1980.

Conclusions

It is concluded from this research that many companies still lack the required expertise and necessary personnel to comply with the ever-changing environmental laws. As a result consultants are being hired and new structural arrangements are being instituted in the organizations. These companies are finding it difficult to keep pace with the technological advances required by the new laws.

New laws are being passed yearly by federal, state, and local governments. It is difficult for businesses to make the technological advances required by the new laws. However, the combined effort of industry organizations is minimal or completely lacking. In addition, every increase in requirements becomes more expensive, yielding an expense which may cause an increase in the final prices offered to consumers.

Small marginal businesses are the group most seriously affected by the requirements of the environmental laws. Although not the only cause, the cost of compliance with environmental laws has caused many marginal businesses to shut down operations.

Although the federal environmental laws are national in scope, a state law may vary considerably from the federal laws. An organization must comply with the most stringent of the laws.

Twenty-nine out of the fifty states have passed "little NEPAs" patterned after the National Environmental Policy Act. The other twenty-one states are expected to legislate environmental impact statement requirements that will cover state, local, and private activities.

These conclusions lead to the following recommendations.

Recommendations

1. As different federal agencies and the various states have different requirements, businessmen should review guidelines published by the particular agency or state to assure that the requirements are being adequately met.

2. If adequate resources are available, it is recommended that a full-time employee who possesses expertise in the environmental area through both formalized training and practical experience be hired by companies.

3. If such an employee (referred to above) cannot be located, a second alternative is to hire consultants on a contractual basis.

4. It is recommended that this "environmental" employee be placed in either a line or staff position which reports directly to the president of the organization, and that the title be indicative of the rank in the organization, such as vice-president of environmental affairs.

5. Companies should take advantage of a ripe opportunity for making the public aware of their efforts and successes in

the pollution control area. Such public relations activities can only serve to enhance the company's public image.

6. Legislators and industry representatives should be made aware of the opinions of businessmen so that these views can be adequately represented in the legislative activities. It is recommended that the members of state and federal Congresses be made aware, for instance, that businessmen hold the opinion that the laws are not given adequate time to work before new laws are passed. Congress should also be made aware that the requirements of the laws may exceed existing technology.

7. Industry organizations should take advantage of the opportunity to do industry-wide research that will benefit the entire industry. Allowing each participating company to pay a share of the research and development expenses will reduce the expense to the individual business while the business benefits from greater expertise.

8. Contact the agency which has direct control over the industry involved in said company for specific guidelines that must be followed in the filing of environmental assessment reports through that agency.

9. Contact the Environmental Protection Agency for help in determining which agency is to be designated the lead agency when two or more agencies are expected to react to a single impact statement.

10. As the impact statement must be filed at least ninety days before operations begin or new sections are taken, draft statements should be filed at least one year before the anticipated action is to commence.

11. For large businesses, weigh the merits of leveraged leasing and industrial bonds as means of financing the costs of pollution abatement efforts and equipment; for small businesses, be aware of the possible availability of loans from the Small Business Administration to partially or completely finance the required efforts.

12. In-company research should be conducted to weigh the possibility of converting some of the costs of pollution control into profitable by-products or savings through improved efficiency.

APPENDIX A

ADDRESSES AND STATES COVERED IN
EPA REGIONAL DISTRICTS

<u>Address of Regional Administrators</u>	<u>States</u>
Environmental Protection Agency Region I John F. Kennedy Federal Building Room 2302 Boston, Massachusetts 02203	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
Environmental Protection Agency Region II 26 Federal Plaza Room 908 New York, New York 10007	New Jersey, New York, Virgin Islands, Puerto Rico
Environmental Protection Agency Region III Curtis Building Sixth and Walnut Street Philadelphia, Pennsylvania 19106	Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia
Environmental Protection Agency Region IV 1421 Peachtree Street, N.W. Atlanta, Georgia 30309	Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina
Environmental Protection Agency Region V 1 North Wacker Drive Chicago, Illinois 60606	Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin
Environmental Protection Agency Region VI 1600 Patterson Street Suite 1100 Dallas, Texas 75201	Arkansas, Louisiana, New Mexico, Oklahoma, Texas

Environmental Protection Agency
Region VII
1735 Baltimore Avenue
Kansas City, Missouri 64108

Iowa, Kansas,
Missouri, Nebraska

Environmental Protection Agency
Region VIII
1860 Lincoln Street
Suite 900
Denver, Colorado 80203

Colorado, Montana,
North Dakota, South
Dakota, Utah, Wyoming

Environmental Protection Agency
Region IX
100 California Street
San Francisco, California 94111

Arizona, California,
Hawaii, Nevada, Guam,
American Samoa, Trust
Territory of the
Pacific Islands

Environmental Protection Agency
Region X
Seattle, Washington 98101

Alaska, Idaho, Oregon,
Washington

APPENDIX B

SUMMARY OF FEDERAL AIR POLLUTION LEGISLATION

- 1955 PL 84-195: Untitled. Provided temporary authority and \$5 million annually for 5 years for federal program of research in air pollution and technical assistance to state and local governments.
- 1959 Extension of 1955 act for 4 more years.
- 1963 PL 88-206: Clean Air Act. Granted permanent authority to federal air pollution control activities and authorized expenditures of \$95 million over 3 years. Major provisions: (1) provided for federal grants to state and local air pollution control agencies to establish and improve their control programs; (2) provided for federal action to abate interstate air pollution through a system of hearings, conferences, and court actions; (3) provided for an expanded federal research and development program with particular emphasis on motor vehicle pollution and sulfur oxide emissions from coal and fuel oil combustion.
- 1965 PL 89-272 (Title I): Clean Air Act Amendments. (1) provided for the promulgation of national standards relating to motor vehicle pollution (initially applied to the 1968 model year); (2) provided for cooperation with Canada and Mexico to abate international air pollution.
- 1965 PL 89-675: Clean Air Act Amendments. Authorized 3-year, \$186 million expansion of air pollution program, including funds to operate local control agencies.
- 1967 PL 90-148: Air Quality Act (amending the Clean Air Act). Enunciated a national policy of air quality enhancement and provided a procedure for designation of air quality control regions and setting of standards by cooperation between federal and state governments. Also provided for registration of fuel additives.
- 1969 PL 91-137: Clean Air Act Amendments. Extended authorization for research on low-emission fuels and motor vehicles.
- 1970 PL 91-604: Clean Air Act Amendments. Provided for the establishment of national ambient air quality standards and their achievement by July 1, 1975, through the implementation plans of air quality control regions and

states. Provided for 90 per cent reductions of automotive hydrocarbon and carbon monoxide emissions from 1970 levels by the 1975 model year and 90 per cent in nitrogen oxide emissions from 1971 levels by the 1976 model year (with 1-year extensions if necessary). Provided for studies of aircraft emissions and noise pollution.

Source: Laurent Hodges, Environmental Pollution (New York, 1973), p. 318.

APPENDIX C

JURISDICTIONS INCLUDED IN ARKANSAS
AIR QUALITY CONTROL REGIONS

CENTRAL ARKANSAS INTRASTATE AQCR

Effective: 3/9/71 42 CFR 481.138

<u>In Arkansas</u>		
Chicot County	Falkner County	Perry County
Clark County	Garland County	Pope County
Cleveland County	Grant County	Pulaski County
Conway County	Hot Spring County	Saline County
Dallas County	Jefferson County	Yell County
Desha County	Lincoln County	
Drew County	Lonoke County	

METROPOLITAN FORT SMITH INTERSTATE AQCR

Effective: 3/9/71 42 CFR 381.63

<u>In Arkansas</u>		
Benton County	Sebastian County	Washington County
Crawford County		
<u>In Oklahoma</u>		
Adair County	Le Flore County	Sequoyah County
Cherokee County		

METROPOLITAN MEMPHIS INTERSTATE AQCR

Effective: 4/29/70 42 CFR 481.44

<u>In Arkansas</u>	<u>In Mississippi</u>	<u>In Tennessee</u>
Crittenden County	De Soto County	Shelby County

MONROE-EL DORADO INTERSTATE AQCR

Effective: 12/8/70 42 CFR 481.92

<u>In Louisiana</u>		
Caldwell Parish	La Salle Parish	Tensas Parish
Catahoula Parish	Madison Parish	Union Parish
Concordia Parish	Morehouse Parish	West Carroll Parish
East Carroll Parish	Ouachita Parish	
Franklin Parish	Richland Parish	
<u>In Arkansas</u>		
Ashley County	Calhoun County	Quachita County
Bradley County	Navada County	Union County

NORTHEAST ARKANSAS INTRASTATE AQCR
 Effective: 3/9/71 42 CFR 481.139

<u>In Arkansas</u>		
Arkansas County	Lawrence County	Randolph County
Clay County	Lee County	Saint Francis County
Craighead County	Mississippi County	Sharp County
Cross County	Monroe County	White County
Greene County	Phillips County	Woodruff County
Independence County	Poinsett County	
Jackson County	Prairie County	

NORTHWEST ARKANSAS INTRASTATE AQCR
 Effective: 3/9/71 42 CFR 381.140

<u>In Arkansas</u>		
Baxter County	Johnson County	Polk County
Boone County	Logan County	Scott County
Carroll County	Madison County	Searcy County
Cleburne County	Marion County	Stone County
Franklin County	Montgomery County	Van Buren County
Fulton County	Newton County	
Izard County	Pike County	

SHREVEPORT-TEXARKANA-TYLER INTERSTATE AQCR
 Effective: 12/9/70 42 CFR 481.94

<u>In Arkansas</u>		
Columbia County	Lafayette County	Sevier County
Hempstead County	Little River County	
Howard County	Miller County	

<u>In Louisiana</u>		
Bienville Parish	De Soto Parish	Red River Parish
Bossier Parish	Jackson Parish	Sabine Parish
Caddo Parish	Lincoln Parish	Webster Parish
Claiborne Parish	Natchitoches Parish	Winn Parish

In Oklahoma
 McCurtain County

<u>In Texas</u>		
Anderson County	Harrison County	Red River County
Bowie County	Henderson County	Rusk County
Camp County	Hopkins County	Smith County
Cass County	Lamar County	Titus County
Cherokee County	Marion County	Upshur County
Delta County	Morris County	Van Zandt County
Franklin County	Panola County	Wood County
Gregg County	Rains County	

JURISDICTIONS INCLUDED IN LOUISIANA
AIR QUALITY CONTROL REGIONS

MONROE-EL DORADO INTERSTATE AQCR
Effective: 12/8/70 42 CFR 381.92

<u>In Louisiana</u>		
Caldwell Parish	La <u>S</u> alle Parish	Tensas Parish
Catahoula Parish	Madison Parish	Union Parish
Concordia Parish	Morehouse Parish	West Carroll Parish
East Carroll Parish	Ouachita Parish	
Franklin Parish	Richland Parish	

<u>In Arkansas</u>		
Ashley County	Calhoun County	Ouachita County
Bradley County	Nevada County	Union County

SHREVEPORT-TEXARKANA-TYLER INTERSTATE AQCR
Effective: 12/9/70 42 CFR 381.94

<u>In Arkansas</u>		
Columbia County	Lafayette County	Sevier County
Hempstead County	Little River County	
Howard County	Miller County	

<u>In Louisiana</u>		
Bienville Parish	De <u>S</u> oto Parish	Red River Parish
Bossier Parish	Jackson Parish	Sabine Parish
Caddo Parish	Lincoln Parish	Webster Parish
Claiborne Parish	Nathitoches Parish	Winn Parish

In Oklahoma
McCurtain County

<u>In Texas</u>		
Anderson County	Harrison County	Rusk County
Bowie County	Henderson County	Smith County
Camp County	Hopkins County	Titus County
Cass County	Marion County	Upshur County
Cherokee County	Morris County	Van Zandt County
Delta County	Panola County	Wood County
Franklin County	Rains County	
Gregg County	Red River County	

SOUTHERN LOUISIANA-SOUTHEAST TEXAS INTERSTATE AQCR
 Effective: 8/22/70 42 CFR 481.53

<u>In Louisiana</u>		
Acadia Parish	Jefferson Parish	St. Landry Parish
Allen Parish	Jefferson Davis P.	St. Martin Parish
Ascension Parish	Lafayette Parish	St. Mary Parish
Assumption Parish	Lafourche Parish	St. Tammany Parish
Avoyelles Parish	Livingston Parish	Tangipahoa Parish
Beauregard Parish	Orleans Parish	Terrebonne Parish
Calcasieu Parish	Plaquemines Parish	Vermilion Parish
Cameron Parish	Point Coupee Parish	Vernon Parish
East Baton Rouge P.	Rapides Parish	Washington Parish
East Feliciana P.	St. Bernard Parish	West Baton Rouge P.
Evangeline Parish	St. Charles Parish	West Feliciana P.
Grant Parish	St. Helena Parish	
Iberia Parish	St. James Parish	
Iberville Parish	St. John the Baptist Parish	

<u>In Texas</u>		
Angelina County	Nacogdoches County	San Augustine County
Hardin County	Newton County	San Jacinto County
Houston County	Orange County	Shelby County
Jasper County	Polk County	Trinity County
Jefferson County	Sabine County	Tyler County

JURISDICTIONS INCLUDED IN OKLAHOMA
 AIR QUALITY CONTROL REGIONS

CENTRAL OKLAHOMA INTRASTATE AQCR
 Effective: 3/31/71 42 CFR 481.47

<u>In Oklahoma</u>		
Canadian County	Lincoln County	McClain County
Cleveland County	Logan County	Oklahoma County
Grady County	Kingfisher County	Pottawatomie County

METROPOLITAN FORT SMITH INTERSTATE AQCR
 Effective: 3/9/71 42 CFR 481.63

<u>In Arkansas</u>		
Benton County	Sebastian County	Washington County
Crawford County		

<u>In Oklahoma</u>		
Adair County	Le Flore County	Dequoyah County
Cherokee County		

NORTH CENTRAL OKLAHOMA INTRASTATE AQCR
 Effective: 3/31/71 42 CRF 481.124

<u>In Oklahoma</u>		
Garfield County	Kay County	Payne County
Grant County	Noble County	

NORTHEASTERN OKLAHOMA INTRASTATE AQCR
 Effective: 3/31/71 42 CRF 381.79

<u>In Oklahoma</u>		
Craig County	Nowata County	Rogers County
Creek County	Okmulgee County	Tulsa County
Delaware County	Osage County	Wagoner County
Mayes County	Ottawa County	Washington County
Muskogee County	Pawnee County	

NORTHWESTERN OKLAHOMA INTRASTATE AQCR
 Effective: 3/31/71 42 CRF 481.126

<u>In Oklahoma</u>		
Alfalfa County	Dewey County	Texas County
Beaver County	Ellis County	Woods County
Blaine County	Harper County	Woodward County
Cimarron County	Major County	
Custer County	Roger Mills County	

SHREVEPORT-TEXARKANA-TYLER INTERSTATE AQCR
 Effective: 12/9/70 42 CFR 481.94

<u>In Arkansas</u>		
Columbia County	Lafayette County	Sevier County
Hempstead County	Little River County	
Howard County	Miller County	

<u>In Louisiana</u>		
Bienville Parish	De Sota Parish	Red River Parish
Bossier Parish	Jackson Parish	Sabine Parish
Caddo Parish	Lincoln Parish	Webster Parish
Claiborne Parish	Natchitoches Parish	Winn Parish

<u>In Oklahoma</u>
McCurtain County

<u>In Texas</u>		
Anderson County	Harrison County	Red River County
Bowie County	Henderson County	Rusk County
Camp County	Hopkins County	Smith County
Cass County	Lamar County	Titus County
Cherokee County	Marion County	Upshur County
Delta County	Morris County	Van Zandt County
Franklin County	Panola County	Wood County
Gregg County	Rains County	

SOUTHEASTERN OKLAHOMA INTRASTATE AQCR
 Effective: 3/31/71 42 CRF 481.123

<u>In Oklahoma</u>		
Atoka County	Hughes County	Okfuskee County
Bryan County	Johnston County	Pittsburg County
Carter County	Latimer County	Pontotoc County
Choctaw County	Love County	Pushmataha County
Coal County	McIntosh County	Seminole County
Garvin County	Marshall County	
Haskell County	Murray County	

SOUTHWESTERN OKLAHOMA INTRASTATE AQCR
 Effective: 3/31/71 42 CFR 481.125

<u>In Oklahoma</u>		
Beckham County	Greer County	Kiowa County
Caddo County	Harmon County	Stephens County
Comanche County	Jackson County	Tillman County
Cotton County	Jefferson County	Washita County

JURISDICTIONS INCLUDED IN NEW MEXICO
 AIR QUALITY CONTROL REGIONS

ALBUQUERQUE-MID RIO GRANDE INTRASTATE AQCR
 Effective: 3/31/71 42 CFR 481.83

In New Mexico
Bernalillo County

Sandoval County - those portions east of the Continental Divide, and not included within the Jicarilla Apache Indian Reservation.

Valencia County - those portions east of a line described as follows: starting at the point at which

the south boundary of Bernalillo County intersects with the section line between sections 1 and 2 T. 7N., R. 2 W.; thence south to the southern boundary of the Laguna Indian Reservation between sections 25 and 36 T. 7 N., R. 2 W.; then southerly on section lines to the Socoro-Valencia County line at sections 11, 12, 13, and 14, T. 5 N., R. 2 W.

ARIZONA-NEW MEXICO SOUTHERN BORDER INTERSTATE AQCR
Effective: 3/31/71 42 CFR 481.99

Cochise County	<u>In Arizona</u> Graham County	Greenlee County
Grant County	<u>In New Mexico</u> Hidalgo County	Luna County

EL PASO-LAS CRUCES-ALAMOGORDO INTERSTATE AQCR
Effective: 3/31/71 42 CRF 481.82

Brewster County	<u>In Texas</u> El Paso County	Jeff Davis County
Culberston County	Hudspeth County	Presidio County
Dona Ana County	<u>In New Mexico</u> Otero County	Sierra County
Lincoln County		

FOUR CORNERS INTERSTATE AQCR
Effective: 2/9/71 42 CRF 481.121

Apache County	<u>In Arizona</u> Navajo County	Vabapai County
Coconino County		
Archuleta County	<u>In Colorado</u> La Plata County	San Juan County
Dolores County	Montezuma County	
	<u>In New Mexico</u> San Juan County	

Rio Arriba County - portion on the Pacific slope of the Continental Divide, and all portions of the Jicarilla Apache Indian Reservation on the Atlantic slope of the Continental Divide.

- Sandoval County - portion on the Pacific slope of the Continental Divide, and all portions of the Jicarilla Apache Indian Reservation on the Atlantic slope of the Continental Divide
- McKinley County - portion on the Pacific slope of the Continental Divide.
- Valencia County - portion with the Zuni and Ramah Navajo Indian Reservations.

	<u>In Utah</u>	
Emery County	Iron County	Washington County
Garfield County	Kane County	Wayne County
Grand County	San Juan County	

NORTHEASTERN PLAINS INTRASTATE AQCR
Effective: 3/31/71 42 CRF 481.240

	<u>In New Mexico</u>	
Colfax County	Mora County	Union County
Guadalupe County	San Miguel County	
Harding County	Torrance County	

PECOS-PERMIAN BASIN INTRASTATE AQCR
Effective: 3/31/71 42 CRF 481.242

	<u>In New Mexico</u>	
Chaves County	Eddy County	Roosevelt County
Curry County	Lea County	
De Baca County	Quay County	

SOUTHWESTERN MOUNTAINS-AUGUSTINE PLAINS INTRASTATE AQCR
Effective: 3/31/71 42 CRF 481.241

	<u>In New Mexico</u>
Catron County	Socorro County

- McKinley County - portions east of the Continental Divide.
- Valencia County - portions (excluding the Zuni and Ramah Navajo Indian Reservations) west of a line described as follows: Starting at the point at which the south boundary of Bernalillo County intersects with the section line between sections 1 and 2 T. 7 N., R. 2 W.; thence south to the southern

boundary of the Laguna Indian Reservation between sections 35 and 36 T. 7 N., R. 2 W.; then southerly on section lines to the Secorro-Valencia County line at sections 11, 12, 13, and 14, T. 5 N., R. 2 W.

UPPER RIO GRANDE VALLEY INTRASTATE AQCR
Effective: 3/31/71 42 CFR 481. 239

<u>In New Mexico</u>		
Los Alamos County	Santa Fe County	Taos County
Rio Arriba County - portions east of the Continental Divide (excluding the Jicarilla Apache Indian Reservation).		

JURISDICTIONS INCLUDED IN TEXAS
AIR QUALITY CONTROL REGIONS

ABILENE-WICHITA FALLS INTRASTATE AQCR
Effective: 2/9/71 42 CFR 481.132

<u>In Texas</u>		
Archer County	Foard County	Scurry County
Baylor County	Hardeman County	Shackelford County
Brown County	Haskell County	Stephens County
Callahan County	Jack County	Stonewall County
Childress County	Jones County	Taylor County
Clay County	Kent County	Throckmorton County
Coleman County	Knox County	Wichita County
Comanche County	Mitchell County	Wilbarger County
Cottle County	Montague County	Young County
Eastland County	Nolan County	
Fisher County	Runnels County	

AMARILLO-LUBBOCK INTRASTATE AQCR
Effective: 2/9/71 42 CRF 481.133

<u>In Texas</u>		
Armstrong County	Gray County	Motley County
Bailey County	Hale County	Ochiltree County
Briscoe County	Hall County	Oldham County
Carson County	Hansford County	Parmer County
Castro County	Hartley County	Potter County
Cochran County	Hemphill County	Randall County

Collingsworth County	Hockley County	Robert's County
Crosby County	Hutchinson County	Sherman County
Dallas County	King County	Swisher County
Deaf Smith County	Lamb County	Terry County
Dickens County	Lipscomb County	Wheeler County
Donley County	Lubbock County	Yoakum County
Floyd County	Lynn County	
Garza County	Moore County	

AUSTIN-WACO INTRASTATE AQCR
 Effective: 2/9/71 42 CRF 481.134

<u>In Texas</u>		
Bastrop County	Fayette County	Llano County
Bell County	Freestone County	McLennan County
Blanco County	Grimes County	Madison County
Bosque County	Hamilton County	Milam County
Brazos County	Hays County	Mills County
Burleson County	Hill County	Robertson County
Burnet County	Lampasas County	Travis County
Caldwell County	Lee County	Washington County
Coryell County	Leon County	Williamson County
Falls County	Limestone County	

BROWNSVILLE-LAREDO INTRASTATE AQCR
 Effective: 2/9/71 42 CRF 481.135

<u>In Texas</u>		
Cameron County	Starr County	Zapata County
Hidalgo County	Webb County	
Jim Hogg County	Willacy County	

CORPUS CHRISTI-VICTORIA INTRASTATE AQCR
 Effective: 2/9/71 42 CRF 481.136

<u>In Texas</u>		
Aransas County	Goliad County	Live Oak County
Bee County	Jackson County	McMullen County
Brooks County	Jim Wells County	Nueces County
Calhoun County	Kenedy County	Refugio County
De Witt County	Kleberg County	San Patricio County
Duval County	Lavaca County	Victoria County

EL PASO-LAS CRUCES-ALAMOGORDON INTERSTATE AQCR
 Effective: 3/31/71 42 CRF 481.82

<u>In Texas</u>		
Brewster County	El Paso County	Jeff Davis County
Culbertson County	Hudspeth County	Presidio County
<u>In New Mexico</u>		
Dona Ana County	Otero County	Sierra County
Lincoln County		

METROPOLITAN DALLAS-FORT WORTH INTRASTATE AQCR
 Effective: 2/9/71 42 CRF 481.39

<u>In Texas</u>		
Collin County	Grayson County	Rockwall County
Cooke County	Hood County	Somervell County
Dallas County	Hunt County	Tarrant County
Denton County	Johnson County	Wise County
Ellis County	Kaufman County	
Erath County	Navarro County	
Fannin County	Palo Pinto County	

METROPOLITAN HOUSTON-GALVESTON INTRASTATE AQCR
 Effective: 2/9/71 42 CRF 481.38

<u>In Texas</u>		
Austin County	Galveston County	Walker County
Brazoria County	Harris County	Waller County
Chambers County	Liberty County	Wharton County
Colorado County	Matagorda County	
Fort Bend County	Montgomery County	

METROPOLITAN SAN ANTONIO INTRASTATE AQCR
 Effective: 2/9/71 42 CRF 480.40

<u>In Texas</u>		
Atascosa County	Gonzales County	Mason County
Bandera County	Guadalupe County	Maverick County
Bexar County	Karnes County	Medina County
Comal County	Kendall County	Real County
Dimmit County	Kerr County	Uvalde County
Edwards County	Kimble County	Val Verde County
Frio County	Kinney County	Wilson County
Gillespie County	La Salle County	Zavala County

MIDLAND-ODESSA-SAN ANGELO INTRASTATE AQCR
 Effective: 2/9/71 42 CRF 481.137

<u>In Texas</u>		
Andrews County	Gaines County	Midland County
Borden County	Glasscock County	Pecos County
Coke County	Howard County	Reagan County
Concho County	Irion County	Reeves County
Crane County	Loving County	San Saba County
Crockett County	Martin County	Schleicher County
Dawson County	McCulloch County	Sterling County
Ector County	Menard County	Sutton County
Terrell County	Upton County	Winkler County
Tom Green County	Ward County	

SHREVEPORT-TEXARKANA-TYLER INTERSTATE AQCR
 Effective: 2/9/71 42 CFR 481.94

<u>In Arkansas</u>		
Columbia County	Lafayette County	Sevier County
Hempstead County	Little River County	
Howard County	Miller County	

<u>In Louisiana</u>		
Bienville Parish	De Soto Parish	Red River Parish
Bossier Parish	Jackson Parish	Sabine Parish
Caddo Parish	Lincoln Parish	Webster Parish
Claiborne Parish	Natchitoches Parish	Winn Parish

<u>In Oklahoma</u>		
	McCurtain County	

<u>In Texas</u>		
Anderson County	Harrison County	Red River County
Bowie County	Henderson County	Rusk County
Camp County	Hopkins County	Smith County
Cass County	Lamar County	Titus County
Cherokee County	Marion County	Upshur County
Delta County	Morris County	Van Zandt County
Franklin County	Panola County	Wood County
Gregg County	Rains County	

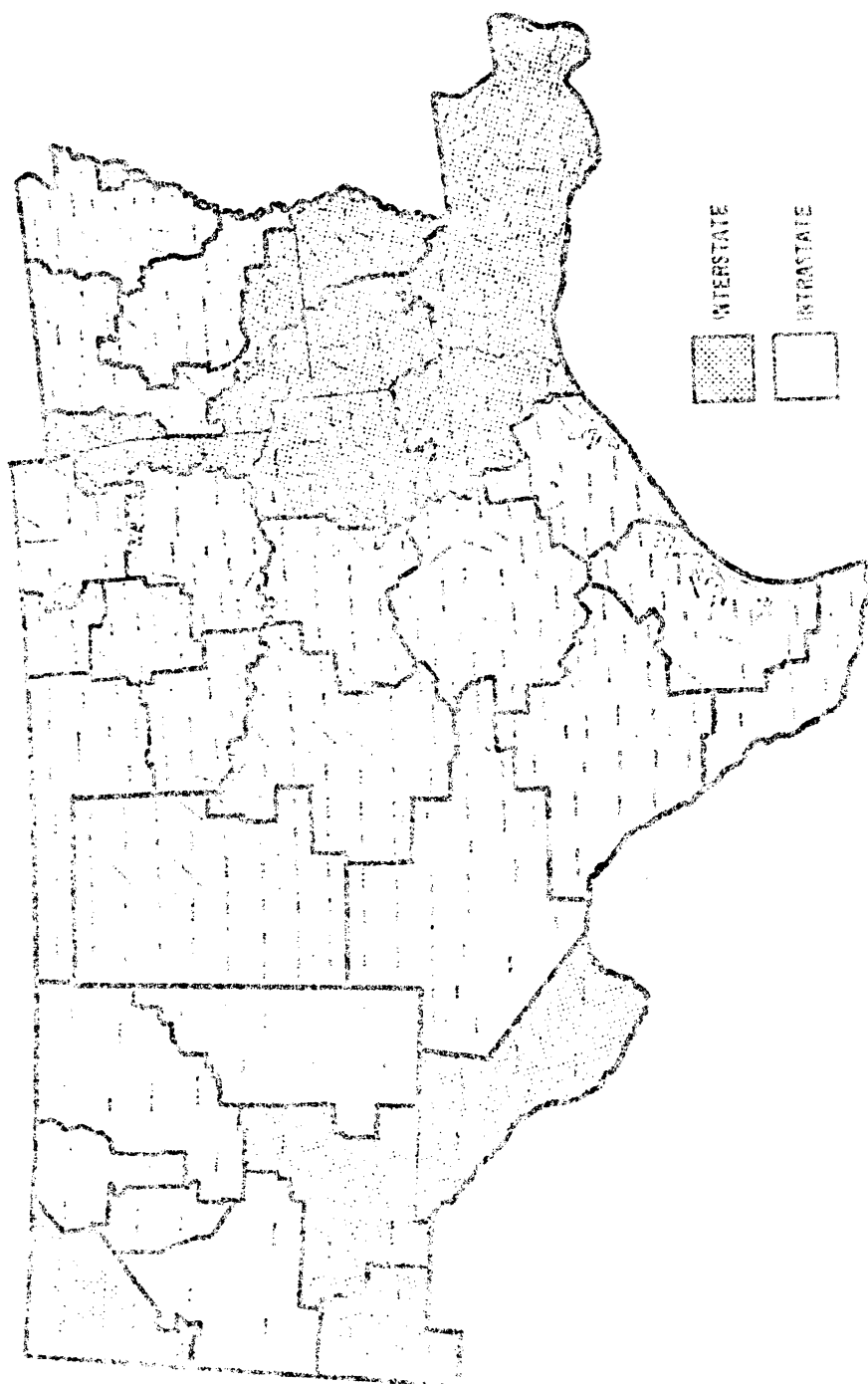
SOUTHERN LOUISIANA-SOUTHEAST TEXAS INTERSTATE AQCR
 Effective: 2/9/71 . 42 CRF 481. 53

In Louisiana

Acadia Parish	Iberville Parish	St. James Parish
Allen Parish	Jefferson Parish	St. John the Baptist P.
Ascension Parish	Jeffersson Davis P.	St. Landry Parish
Assumption Parish	Lafayette Parish	St. Martin Parish
Avoyelles Parish	Lafourche Parish	St. Mary Parish
Beauregard Parish	Livingston Parish	St. Tammany Parish
Calcasieu Parish	Orleans Parish	Tangipahoa Parish
Cameron Parish	Plaquemines Parish	Terrebonne Parish
East Baton Rouge P.	Pointe Coupee Parish	Vermilion Parish
East Feliciana P.	Rapides Parish	Vernon Parish
Evangeline Parish	St. Bernard Parish	Washington Parish
Grant Parish	St. Charles Parish	West Baton Rouge P.
Iberia Parish	St. Helena Parish	West Feliciana Parish

In Texas

Angelina County	Nacogdoches County	San Augustine County
Hardin County	Newton County	San Jacinto Couny
Houston County	Orange County	Shelby County
Jasper County	Polk County	Trinity County
Jefferson County	Sabine County	Tyler County



Air Quality Control Regions in EPA Region VI: New Mexico, Oklahoma, Arkansas, Texas, and Louisiana.

APPENDIX D

SUMMARY OF FEDERAL WATER POLLUTION LEGISLATION

- 1899 Refuse Act of 1899 (River and Harbor Act of 1899, Sections 9 through 20). Prohibited discharges into navigable rivers; permitted qui tam actions by citizens.
- 1912 Public Health Service Act authorized investigation of water pollution in relation to human diseases.
- 1924 PL 68-238: Oil Pollution Act. Prohibited discharge of oil by any means except in emergency or by accident into navigable waters of the U. S.
- 1948 PL 80-845: Water Pollution Control Act. Provided 5-year authorization to fund research studies, low-interest loans for construction of sewage and waste treatment works, and the Federal Water Pollution Control Advisory Board. Authorized the Department of Justice to bring suits against individuals or firms, but only after notice, hearing, and consent of the state involved.
- 1952 PL 82-579: Water Pollution Control Act Extension. Extended the Water Pollution Control Act of 1948 for 3 more years.
- 1956 PL 84-660: Water Pollution Control Act Amendments. Provided permanent authority. Provided \$50 million annual authorization for grants for construction of sewage treatment works. Provided for abatement of interstate water pollution by federal enforcement through a conference-public hearing-court action procedure.
- 1961 PL 87-88: Federal Water Pollution Control Act. Permitted the Secretary of Health, Education, and Welfare, through the Department of Justice, to bring court suits to stop pollution of interstate waters without seeking permission of state. Extended pollution abatement procedures to navigable intrastate and coastal waters with permission of state. Authorized seven regional laboratories for research and development in improved methods of sewage treatment and control. Authorized funds for grants to local communities for sewage treatment plants: \$80 million in fiscal year 1962, \$90 million in 1963, and \$100 million each from 1964 to 1967.

- 1961 PL 87-167: Oil Pollution Act. Enacted to implement provisions of the International Convention for the Prevention of the Pollution of the Sea by Oil, 1954.
- 1965 PL 89-234: Water Quality Act. Enunciated a national policy of water quality enhancement. Established the Federal Water Pollution Control Administration (FWPCA). Provided for the states to adopt water quality standards for interstate waters and plans for implementation and enforcement, to be submitted by June 30, 1967, to the Secretary of Health, Education and Welfare (later to Secretary of Interior after FWPCA was transferred to the Department of the Interior) for approval as federal standards; authorized Secretary to initiate federal actions to establish standards if the state criteria were inadequate. Authorized grants for research and development to control storm water and combined sewer overflows and authorized \$150 million each in fiscal years 1966 and 1967 for sewage treatment plants grants.
- 1966 PL 89-551: Oil Pollution Act of 1961 amendments. Various minor amendments.
- 1966 PL 89-753: Clean Water Restoration Act. Provided for project grants for research and development of advanced waste treatment methods for municipal and industrial wastes. Authorized grants of \$450 million in fiscal year 1968, \$70 million in 1969, \$1 billion in 1970, and \$1.25 billion in 1971 for construction of treatment plants. Amended the Oil Pollution Act of 1924 by transferring responsibility to Secretary of the Interior and provided for suits against "grossly negligent, or willful spilling, leaking, pumping, pouring, emitting, or emptying of oil."
- 1970 PL 91-224 (Title I): Water Quality Improvement Act. Strengthened federal authority to deal with sewage discharges from vessels, hazardous polluting substances, and pollution from federal and federally related activities. Provided for liability for oil spills from onshore and offshore drilling facilities and from vessels.

Source: Laurent Hodges, Environmental Pollution (New York, 1973), p. 320-321.

APPENDIX F

SUMMARY OF FEDERAL LEGISLATION RELATING TO SOLID WASTES

- 1965 PL 89-272 (Title II): Solid Waste Disposal Act. Began a national research and development and demonstration program on solid wastes and provided financial assistance to interstate, state, and local agencies for planning and establishing solid waste disposal programs. Authorized increasing amounts from \$10 million in fiscal year 1966 to \$32.5 million in 1969 to be spent by the Department of Health, Education and Welfare and by the Bureau of Mines in the Department of the Interior.
- 1968 PL 90-574: Solid Waste Department Act amendment. Authorized \$32 million for fiscal year 1970.
- 1970 PL 91-512: Resource Recovery Act. Provided for extended research into new and improved methods to recover, recycle, and reuse wastes and for financial assistance to the states in the construction of solid waste disposal facilities.

APPENDIX G

INSTRUCTIONS FOR PREPARING ENVIRONMENTAL
ASSESSMENTS FOR CONSTRUCTION GRANT
PROJECTS

The environmental assessment, as required by 40 CFR, Part 6, Vol. 40, April 14, 1975, is one of the most important documents that accompanies a grant application. Environmental assessments will be entered as evidence in hearings and court actions. Therefore, emphasis must be placed on proper preparation. Failure to identify adverse effects that might result from the construction and operation of the project might delay a grant offer.

Keep in mind that the purpose of the environmental review process is to encourage public participation, planning, and decision-making and to insure consideration of environmental factors in developing the project. If a question regarding the adverse impact of the project or any question should arise, you should solicit comments from the involved local agencies or interested groups and include a summary of those comments in the assessments.

Consideration should be given to developing the environmental assessment as a separate, self-contained document. It should describe the project in sufficient detail so that reference to a separate engineering report, except for detailed design data, will not be necessary.

The assessment outline form is presented below. A response must be entered for each topic; if a topic does not apply to a given project, explain why. If additional topics need to be discussed to properly assess the impact of a specific project, additional sections may be added. The outline covers the minimum topics which must be considered. Sources should be provided for all data, maps, tables, charts, etc., used in the assessment.

Care should be taken to assure that all data provided in the Environmental Assessment and the Facility Plan is in full agreement.

Section I. Description of the Proposed Action

*A. Describe the proposed treatment facility.

1. Indicate the size of the plant (include present and design average daily and peak capacity flows and specify the design year).
2. Identify the treatment process(es) proposed.
3. State the expected influent and effluent flow and quality and degree of treatment to be obtained.
4. Describe any special (non-treatment type) units that will be employed at the proposed facility (odor abatement, noise abatement, aesthetic design, etc.).
5. Specify the amount of land needed for the plant site.

*B. Describe the existing treatment plant.

1. Give present average and peak plant capacities (include design year).
2. Identify the treatment process now in use.
3. Give influent and effluent flow and quality data and state the present percent removal rate in terms of degree of treatment.
4. Outline future plans for the plant.

*NOTE: If the project involves modifications to an existing plant, complete Section I.B. first and then complete I.A. as if the modified plant were a new facility.

C. Describe any proposed line work. Give the lengths and sizes of all lines and describe their function.

D. Describe the total area to be affected by this project. Locations of all proposed project elements. It is important that proposed interceptor routes and collection lines be shown by map, especially underdeveloped areas.

E. Generally describe the purpose of the project.

Discuss, in detail, the interrelationship between the project and the Metropolitan Plan, Regional Plan, Basin Plan, Areawide Plan and/or the local (city) Plan of Development. The ways in which this project implements or conforms to these plans should be specified.

F. Provide the present status of the proposed project (preliminary report, final engineering report, final design, final plans, and specifications complete).

Section II. Environmental Setting

- A. Describe the existing environment without the proposed action.
1. Discuss geological elements - Topography of area of the proposed action, identify soil types including their permeability and erosion potential. Geologic structures or formations that have a direct influence on either ground water or surface resources should be specifically discussed.
 2. Discuss hydrological elements - The relevant surface water bodies and groundwater aquifers in the area. Discuss water quality using physical, chemical, and biological parameters. Identify specific point and nonpoint sources of pollution. Identify the types and extent of existing and future surface and groundwater uses. Identify pertinent water quality management plans, court ordered allotments, and federal, state, and local permits in the area. Identify flood occurrence and flood plains, and any Corps of Engineers flood plain plan. Discuss compliance with existing and proposed NPDES permits.
 3. Discuss climatic elements - Precipitation, temperature, prevailing winds. Also describe relevant topographic features which may influence climatic conditions. Discuss existing air quality; ambient levels for the pollutants having a National Ambient Air Quality Standard.
 4. Discuss botanical elements - Those species, vegetative zones, unique plant communities, rare, endangered or threatened species which may be affected.
 5. Discuss zoological elements - Those wildlife, aquatic, rare, endangered or threatened species which may be affected.
 6. Consult the National Register of Historic Places to determine if historic sites are in the project area. Transmit a copy of the environmental assessment to the State Historical Preservation Officer

for review and comment. Attach transmittal letter with comments received (if any) to assessment prior to submittal to state agency.

7. Discuss social and economic conditions - List the current and projected population levels (5, 10, and 20 years). Projection or forecast methods and/or sources should be stated. Discuss employment trends, and health aspects.
8. Discuss miscellaneous elements - Describe national parks or forests, wildlife refuges, wild and scenic rivers, wetlands, coastal zones and environmentally sensitive areas that may be affected. Provide a map to show any of these elements.
9. Present an in-depth discussion of the needs of the project area. Items that would improve the quality of the environment (waste water treatment, solid waste management, roads, parks, zoning ordinances, building codes, land use regulations) should be discussed. The need for the proposed action should be presented in such a manner that it could not be construed as a "project justification statement."
10. Discuss the programs of other federal, state, and local agencies in the area--highways, airports, lakes, housing developments, industrial development parks, and their interaction with the proposed water quality action.
11. Describe land uses - The following should be provided any time interceptors or collectors are being proposed to service underdeveloped areas or routed through such areas. Land use maps, if available, one for existing uses and for proposed future uses. Describe the extent and effectiveness of current land use planning and controls. Describe development trends for industrial, residential, commercial, agricultural, and recreational sectors. Discuss any aspect of these trends which might threaten air or water quality or bring about other environmental problems.

B. Describe the future environment without the proposed project. Forecast the future environmental conditions for the areas under Section II.A. above with the "no project alternative."

Section III. Alternatives to the Proposed Action

This section shall contain a systematic development of feasible alternatives for the solution of the identified water quality problems. Emphasis should be placed on projects that will involve new sites selection and/or interceptor routes. These alternatives must be screened with respect to physical, legal, or institutional constraints; regulatory requirements; capital and operating costs; and significant primary and secondary environmental effects. Irreversible impacts and secondary (induced) impacts. The analysis should consider, when relevant:

- A. Flow and waste reduction measures.
- B. Alternative locations, capacities, and construction phasing of facilities.
- C. Alternative waste management techniques, including treatment and discharge, wastewater reuse and land application.
- D. Alternative methods for sludge disposal, including process options and final disposal options.

The reasons for rejecting any alternatives must be presented in addition to any significant environmental benefits precluded by rejection of an alternative.

Section IV. Environmental Impacts of the Proposed Action

A. Primary Impacts. Discuss those impacts, adverse and beneficial, which can be attributed directly to the proposed action. These would normally be related to construction, operation of the facility, and land use changes at the facility site.

Short Term Impacts.

1. Describe alternatives to land forms, streams, and natural drainage patterns.
2. Specify the erosion control measures to be employed.
3. Describe the extent to which area watercourses will be affected by siltation and sedimentation.
4. Discuss the effects of dredging, tunneling, and trenching on area watercourse.

5. Specify the precautions to be taken to avoid injury to cover vegetation including trees.
6. If clearing will involve the use of herbicides, defoliants, blasting, cutting, or burning, identify and describe the precautionary measures to be taken to protect the area environment.
7. Specify the final disposal method for soil and vegetation spoil.
8. If land is to be acquired, specify the number of people, if any, who will have to be relocated.
9. Discuss the method of land acquisition.
10. Discuss the project's effect on adjacent land values.
11. Discuss the land use changes at the facility site.
12. Discuss compliance with NPDES permit requirement, should the need for bypassing sewage arise during construction.
13. Specify the measures to be taken to control dust during construction.
14. Identify effects of noise during construction.
15. Specify the precautions to be taken to protect area residents and wildlife from construction-related noise.
16. Identify the areas to be affected by blasting.
17. Specify the precautions to be taken to protect area residents and wildlife from the effects of blasting necessary during construction.
18. Specify the measures to be taken to minimize vehicular and pedestrian traffic disruption and danger.
19. Discuss the effects of night work on the area environment.
20. Discuss the safety provisions selected for protecting the public from construction hazards.

Long Term Impacts

1. Specify the type and amount of land that will be affected by construction of the project.
2. Describe the beneficial uses of this land that will be eliminated by construction of the project.
3. Describe how the natural or present character of the area will be changed.
4. Indicate the degree to which the proposed structures will interfere with or obstruct natural views.
5. Describe the architectural techniques that will be used to blend the structures with the environment.
6. Describe the landscaping to be provided.
7. Discuss the relationship between residences and businesses, the project, and prevailing wind patterns.
8. Identify possible odor sources and discuss their effects on parks, residences, businesses, highways, or other public access areas.
9. Present a realistic comprehensive assessment of the project's potential odor problems.
10. If incineration is to be used, specify the measures to be taken to comply with air quality standards.
11. State whether the project conforms with the basin or areawide plans for meeting quality standards.
12. Discuss the effects of the project on present water quality.
13. Discuss the beneficial and adverse effects of the project on aquatic biota.
14. Describe the effects of chlorine residuals on aquatic life.
15. Discuss the possibility of dechlorination.

16. Discuss the project's effect on municipal and industrial water supplies, irrigation, recreation, and other uses.
17. If local water demand is high and supply low, discuss the possibility of wastewater reuse.
18. Describe the effects of reuse on receiving stream water quality.
19. Discuss the possibility of recharging with treated wastewater and describe the probable effects of such a reuse plan on groundwater quality and quantity.
20. If land application of the effluent is proposed, describe its effects on groundwater and surface water quality and quantity.
21. Describe the present and potential market for reclaimed water in the area.
22. If this project will result in the diversion of flows between basins, discuss the effects on both basins.
23. Specify the ultimate disposal methods for grit, ash, and sludge.
24. Discuss the possibility of solids reuse.
25. Identify and describe the project's effects on historical, cultural, and archaeological resources through coordination with the State Historical Preservation Officer (see Section II, A.5. above).
26. Identify and describe all local areas designated for use as recreational areas or natural preserves. Discuss the project's effect on these areas and any future areas that are proposed.
27. Describe any potential noise levels from the facility operation in terms of decibels, time of occurrence, duration, and types of noise and vibration.
28. Describe the measures to be taken to eliminate noise.

29. Describe the precautions to be taken to control access to the facilities.
30. Discuss insect nuisance and required control programs needed as a result of the project.
31. If pesticides are to be used, the method of application should be described and also discuss their potential effects on water quality (ground and surface), and non-target species.
32. Discuss the project's effect on wildlife, birdlife, and aquatic habitats.
33. Indicate the project's physical relation to area flood plains. Discuss the project's effects on the movement of flood waters and describe the measures to be taken to protect the project from flooding.
34. Discuss the project's effect on energy consumption and chemicals used in the treatment process.
35. Discuss the effects of the project on present air quality.

B. Secondary Impacts. Discuss those impacts, adverse and beneficial, that result from indirect or induced changes caused by the "proposed action." Special attention should be given when there is new treatment capacity and/or collectors and interceptors servicing or traversing sparsely populated or underdeveloped areas.

1. Discuss the impact of the project on land uses in the area. What changes in the rate, density or type of development, including residential, commercial, industrial, recreational, and open space may be induced? Maps showing existing and proposed land uses should be based on design year population of the service area.
2. Relate population and land use changes to effects on air quality.
3. Relate population and land use changes to effects on water quality (surface and groundwater).
4. Discuss the effect of the projected growth on public services--such as water supply, wastewater treatment facilities, public utilities, and solid waste disposal facilities.

5. Discuss the impact on economic and social conditions, tax base, employment, neighborhood development trends, and recreational areas.
6. Discuss how anticipated land use and socioeconomic activities related to the proposed action conform or conflict with existing land use plans and/or types of growth desired by area residents.

Section V. Adverse Impacts Which Cannot Be Avoided Should the Proposal Be Implemented

All adverse impacts surfaced in Section IV above should be discussed further in this section. Describe the structural and nonstructural measures to be taken to mitigate or eliminate significant adverse effects. Such measures include change in both structural (facility design, size and location); and nonstructural (staging facilities, developing or enforcing land use regulations). Those impacts which cannot be reduced to acceptable levels, their implications and the reasons why the action is being taken, notwithstanding, shall be described in detail.

Section VI. Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

Describe the extent to which the proposed action involves tradeoffs between short-term environmental gains at the expense of long-term gains or vice-versa and the extent to which the proposed action forecloses future options. Special attention shall be given to effects which narrow the range of future uses of land and water resources or pose long-term risks to health or safety. Explain the reasons the proposed action is believed justified now, rather than reserving a long-term option for other alternatives.

Section VII. Irreversible and Irretrievable Commitment of Resources to the Proposed Action, Should it Be Implemented

Describe the extent to which the proposed action requires commitment of construction materials, person-hours, and funds to design and implement the project. Describe the extent to which the project curtails the range of future uses of land and water resources, for example, induced growth in undeveloped areas may curtail alternative uses for that land. Also, irreversible environmental damage can result from equipment

malfunctions or industrial accidents at the project site. Therefore, the need for any irretrievable and significant commitments of resources shall be fully explained.

Section VIII. Public Participation

A. Discussion: This section should contain a discussion of any objections, complaints, or problems which have been voiced against the proposed action, particularly those raised at public meetings.

B. Public Hearing:

A Public Hearing must be held in accordance with the public participation requirements set forth in 40CFR, Subpart E, Section 6.512, Vol. 40, April 14, 1975; 40 CFR, Part 35, Subpart E, Section 35.917-5, Vol. 39, February 11, 1974, and the following:

Public Hearing Notice: The applicant shall notify the public of the Hearing by prominent advertising at least thirty (3) days prior to the date of the Hearing. This notification shall include the date, time, and place of the Hearing, a brief description of the proposed project, and give at least one local source of detailed information on the proposed project. This detailed information shall include, as a minimum, a complete description of the project, cost and financing information, alternatives to the project, and the environmental effects of all alternatives, including a detailed description of the effects of the project on land use.

Of primary important, the Notice must include the following statement: "One of the purposes of this Hearing (meeting) is to discuss the environmental impacts of the project and alternatives to it."

Public Hearing--the Hearing shall conform to the following general format:

Call to Order

Statement of the Purpose of the Hearing to include the following: "One of the purposes of this Hearing (meeting) is to discuss the potential environmental impacts of the project and alternatives to it."

Swearing In of Witnesses--the following oath is suggested: "Do you swear to tell the truth, the whole truth, and nothing but the truth?"

Testimony

Hearing Record--the Hearing Record, which will be made a part of the grant application, shall include the following:

A copy of the Public Hearing Notice.

A list of those notified of the Hearing to include appropriate state and local agencies and appropriate state and metropolitan clearing-houses; interested environmental and conservation action groups.

A statement, signed by the applicant, stating that the Hearing was held in conformance with Public Hearing Notice.

A list of witnesses including the complete text of their statements.

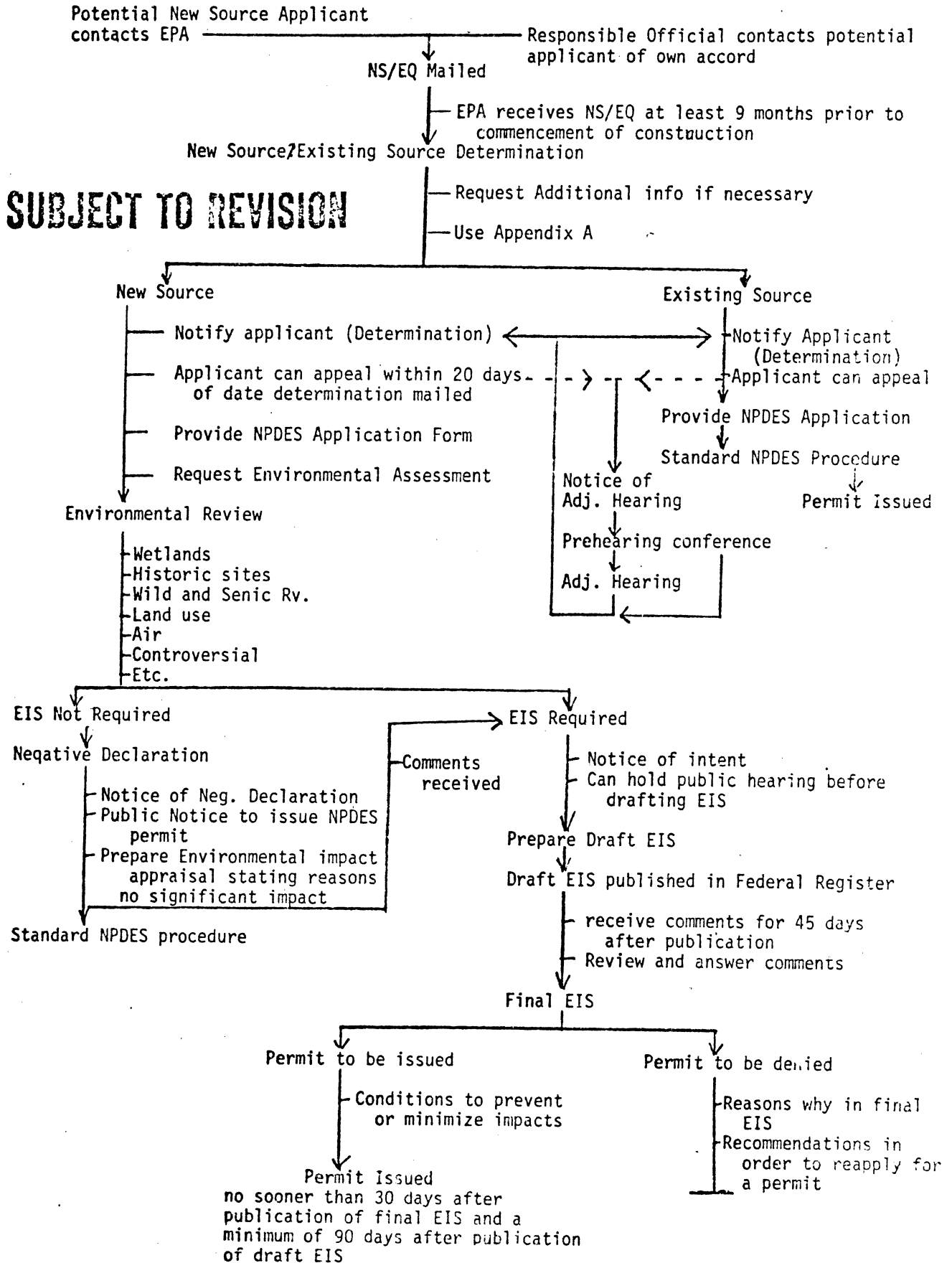
A text of the Statement of the Purpose of the Hearing and the oath administered.

In order to eliminate duplication of hearings, any bona fide public meeting, such as a City Council meeting, may be substituted for a formal Public Hearing, if it conforms to the requirements detailed above and the referenced federal regulations.

C. Coordination of Review:

1. The Environmental Assessment must be sent by the applicant for review and comment to the appropriate District Office of the Corps of Engineers, U. S. Sport Fisheries and Wildlife Service, National Park Service, and the State Historical Preservation Officer. Their review time will be simultaneous with the thirty (30) days or more prior to public hearing and should be so stated in the transmittal letter. See Attachment A for appropriate addresses.

2. A Notice of Public Hearing and Availability of the Environmental Assessment must be sent to the following: (1) Bureau of Land Management, (2) Bureau of Mines, (3) Bureau of Reclamation, (4) Bureau of Outdoor Recreation, (5) U. S. Geological Survey, (6) Department of Housing and Urban Development. This should also be simultaneous with the thirty (30) days or more prior to the public hearing. If an agency requests a copy of the assessment, it should then be transmitted as in item 1 above.
3. The following must be attached to the Environmental Assessment before transmittal to the State Water Pollution Control Agency.
 - a. A copy of all transmittal letters used in sending the assessment to the required review agencies (Item 1 above).
 - b. A copy of the Notice of Public Hearing and Availability sent to each of the required agencies (Item 2 above).
 - c. All comments received from the review agencies.
 - d. A document stating the steps taken in coordinating with the State Historical Preservation Officer to determine if any resources included in or eligible for the National Register of Historic Places are within the area of the proposed project.



APPENDIX I

SUMMARY SHEET FORMAT FOR ENVIRONMENTAL
IMPACT STATEMENTS

(check one)

- Draft
- Final

Environmental Protection Agency

1. Name of action: (check one)
 - Administrative action
 - Legislative action
2. Brief description of action indicating what states (and counties are particularly affected).
3. Summary of environmental impact and adverse environmental effects.
4. List alternatives considered.
5. a. (for draft statements) List all federal, state, and local agencies and other sources from which written comments have been requested.
b. (for final statements) List all federal, state, and local agencies and other sources from which written comments have been received.
6. Dates draft statement and final statement made available to Council on Environmental Quality and to the public.

APPENDIX J

STATE EIS REQUIREMENTS AND/OR PROPOSALS

None/None Proposed	None, but Proposed	Very Limited	Existing
1. Alabama 2. Arkansas 3. Alaska 4. Florida 5. Idaho 6. Illinois 7. Iowa 8. Kansas 9. Kentucky 10. Louisiana 11. Maine 12. Mississippi 13. Missouri 14. New Hampshire 15. Ohio 16. Oklahoma 17. Oregon 18. Pennsylvania 19. Rhode Island 20. South Dakota 21. Tennessee 22. Vermont 23. W. Virginia 24. Wyoming	1. Colorado 2. District of Columbia 3. Georgia 4. South Carolina 5. Utah	1. Arizona 2. Delaware 3. Nebraska 4. New Jersey 5. New York 6. North Dakota Suspended 1. New Mexico	1. California 2. Connecticut 3. Hawaii 4. Indiana 5. Maryland 6. Massachusetts 7. Michigan 8. Minnesota 9. Montana 10. North Carolina 11. Puerto Rico 12. Texas 13. Virginia 14. Washington

APPENDIX K

SUGGESTED STATE ENVIRONMENTAL POLICY ACT

AN ACT to establish a State environmental policy.

Section 1. Short Title

This Act may be cited as the "(Name of State) Environmental Policy Act."

Section 2. Purpose

The purposes of this Act are: to declare a State policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and stimulate the health and welfare of man; and to enrich the understanding of the ecological systems and natural resources important to the people of the State.

Section 3. Findings and Declaration of State Environmental Policy

The Legislature finds and declares as follows:

(a) The maintenance of a quality environment for the people of this State that at all times is healthful and pleasing to the senses and intellect of man now and in the future is a matter of statewide concern.

(b) Every citizen has a responsibility to contribute to the preservation and enhancement of the quality of the environment.

(c) There is a need to understand the relationship between the maintenance of high-quality ecological systems and the general welfare of the people of the State, including their enjoyment of the natural resources of the State.

(d) The capacity of the environment is limited, and it is the intent of the Legislature that the government of the State take immediate steps to identify any critical thresholds for the health and safety of the people of the State and take all coordinated actions necessary to prevent such thresholds from being reached.

(e) It is the intent of the Legislature that to the fullest extent possible, the policies, statutes, regulations, and ordinances of the State (and its political subdivisions) should be interpreted and administered in accordance with the policies set forth in this Act.

(f) It is the intent of the Legislature that the protection and enhancement of the environment shall be given appropriate weight with social and with economic considerations in public policy. Social, economic, and environmental factors shall be considered together in reaching decisions on proposed public activities.

(g) It is the intent of the Legislature that all agencies conduct their affairs with an awareness that they have an obligation to protect the environment for the use and enjoyment of this and all future generations.

(h) It is the intent of the Legislature that all agencies which regulate activities of private individuals, corporations, and public agencies which are found to affect the quality of the environment shall regulate such activities so that major consideration is given to preventing environmental damage.

Section 4. Definitions

Unless the context otherwise requires, the definitions in this section shall govern the construction of the following terms as used in this Act:

(a) "Agency" means the executive and administrative departments, offices, boards, commissions, and other units of the State government, and any such bodies created by the State.¹

or

(a) "Agency" means any state agency, board, or commission or any local agency, including any city, county, and other political subdivision of the State.²

(b) "Actions" include:

(1) Proposals for legislation.

¹Use the first definition of "Agency" if the act is intended to apply only to actions of state agencies.

²Use the alternative definition of "Agency" if the act is intended to apply to actions of both state and local agencies.

- (2) New and continuing projects or activities directly undertaken by any public agency; or supported in whole or part through contracts, grants, subsidies, loans, or other forms of funding assistance from one or more public agencies; or involving the insurance to a person of a lease, permit, license, certificate or other entitlement for use by one or more public agencies.
- (3) Policy, regulations, and procedure-making.

(c) "Actions" do not include:

- (1) Enforcement proceedings or the exercise of prosecutorial discretion in determining whether or not to institute such proceedings.
- (2) Actions of a ministerial nature, involving no exercise of discretion.
- (3) Emergency actions responding to an immediate threat to public health or safety.
- (4) Actions of an environmentally protective regulatory nature.

(d) "Environment" means the physical conditions which will be affected by a proposed action, including land, air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance (existing patterns of population concentration, distribution, growth, and existing community or neighborhood character).

(e) "Environmental impact statement" means a detailed statement setting forth the matters specified in section 5.(b) of this Act. It includes any comments on a draft environmental statement which are received pursuant to section 5(c) of this Act, and the agency's response to such comments, to the extent that they raise issues not adequately resolved in the draft environmental statement.

(f) "Draft environmental impact statement" means a preliminary statement prepared pursuant to section 5(c) of this Act.

Section 5. Environmental Responsibility of Agencies

(a) Agencies shall use all practicable means to realize the policies and goals set forth in this Act, and to maximum extent possible shall take actions and choose alternative which, consistent with other essential consideration of state policy, minimize or avoid adverse environmental effects.

(b) All agencies shall prepare, or cause to be prepared by contract, an environmental impact statement on any (major) action they propose or approve which may have a significant effect on the environment. Such a statement shall include a detailed statement setting forth the following:

- (1) a description of the proposed action and its environmental setting;
- (2) the environmental impact of the proposed action including short term and long term effects;
- (3) any adverse environmental effects which cannot be avoided should the proposal be implemented;
- (4) alternatives to the proposed action;
- (5) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented;
- (6) mitigation measures proposed to minimize the environmental impact; and
- (7) the growth-inducing aspects of the proposed action.

Such a statement shall also include copies or a summary of the substantive comments received by the agency pursuant to subsection (c) of this section, and the agency response to such comments. The purpose of an environmental impact statement is to provide detailed information about the effect which a proposed action is likely to have on the environment, to list ways in which any adverse effects of such an action might be minimized and to suggest alternatives to such an action.

(c) As early as possible in the formulation of a proposal for action that is likely to require the preparation of an environmental impact statement and in all cases prior to preparation of an environmental impact statement, the responsible agency shall prepare or cause to be prepared a draft environmental statement describing in detail the proposed action and

reasonable alternatives to the action, and briefly discussing, on the basis of information then available to the agency, the remaining items set forth in the preceding subsection. The purpose of a draft environmental statement is to inform the public and other public agencies as early as possible about proposed actions that may significantly affect the quality of the environment, and to solicit comments which will assist the agency in determining the environmental consequences of the proposed action. The draft statement should resemble in form and content the environmental impact statement to be prepared after comments have been received and considered pursuant to section 5(b) of this Act; however, the length and detail of the draft environmental statement will necessarily reflect the preliminary nature of the proposal and the early stage at which it is prepared. The draft statement shall be circulated for comment among other public agencies which have jurisdiction by law or special expertise with respect to any environmental impact involved and shall be made available for comment by relevant federal agencies and interested members of the public.

(d) The environmental impact statement, prepared pursuant to subsection (b) of this section, together with the comments of public and Federal agencies and members of the public, shall be filed with the (Office of the Governor) and made available to the public at least 30 days prior to taking agency action on the proposal which is the subject of the environmental impact statement.

(e) An agency may charge a fee to an applicant in order to recover the costs incurred in preparing or causing to be prepared an environmental impact statement on the action which the applicant requests from the agency.

(f) When an agency decides to carry out or approve an action which has been the subject of an environmental impact statement, it shall make an explicit finding that the requirements of subsection (a) of this section have been met and that all feasible action will be taken to minimize or avoid environmental problems that are revealed in the environmental impact statement process.

Section 6. Guidelines and Agency Procedures

(a) After conducting public hearings the (Governor) shall issue Guidelines through regulations implementing the provisions of this Act within (90 days) after the effective date of this Act.

(b) The guidelines issued by the (Governor) shall specifically include:

- (1) Interpretation of terms used in this Act including criteria for determining whether or not a proposed action (may be major or) may have a significant effect on the environment with examples. Social and economic factors may be considered in determining the significance of an environmental effects;
- (2) On the basis of such criteria, identification of those typical agency actions that are likely to require preparation of environmental impact statements;
- (3) A list of classes of actions which have been determined not to have a significant effect on the environment and which thus do not require environmental impact statements under this Act. In adopting the guidelines, the (Governor) shall make a finding that each class of actions in this list does not have a significant effect on the environment;
- (4) The typical associated environmental effects, and methods for assessing such effects, of actions determined to be likely to require preparation of such statements;
- (5) Procedures for obtaining comments on environmental impact statements, including procedures for providing public notice of agency decisions with respect to preparation of a draft environmental statement, or, in the case of major or controversial actions determined not to involve a significant environmental impact, procedures for announcing the decision that no environmental impact statement will be prepared.

(c) Within (90 days) after the (Governor) adopts the Guidelines, the relevant agencies shall adopt and public procedures for implementation of this Act consistent with the Guidelines adopted by the (Governor).

(d) Each agency shall conduct a public hearing in connection with adopting the procedures required by this section.

Section 7. Limitations³

(a) In order to avoid duplication of effort and to promote consistent administration of Federal and State environmental policies, the environmental impact statement required by Section 5 of this Act need not be prepared with respect to actions for which a detailed statement is required to be prepared pursuant to the requirements of the National Environmental Policy Act of 1969 and implementing regulations thereto, provided that such statement complies with the requirements of this Act and the Guidelines adopted pursuant thereto.

(b) The requirements of Section 5 of this Act shall apply to actions undertaken or approved prior to the date of enactment of this Act only if:

- (1) the responsible agency proposes a modification of the action and the modification may result in a significant effect on the environment, or
- (2) a substantial portion of the public funds allocated for the project have not been spent and it is still feasible either to modify the project in such a way as to mitigate potentially adverse environmental effect or to choose a feasible and less environmentally damaging alternative to the project.

³In addition to these limitations, a state may wish to include a specific statute of limitations to govern legal actions brought under this act.

APPENDIX L

DISCUSSION OF THE EFFECTS OF POLLUTION CONTROL
COSTS ON SELECTED INDUSTRIES

Electric Utilities Industry

Estimated total investment required to meet air and thermal pollution control requirements associated with the generation of electricity from 1972 to 1976 will be \$10.7 billion. Of this, \$7.5 billion would be required for air pollution control, and \$3.2 billion would be required for thermal pollution control. It has been suggested that the cost of installing pollution control equipment on existing plants might be twice those included in these estimates.

Annual costs associated with pollution controls were estimated to rise from \$338 million in 1972 to \$2.5 billion in 1976. Please note that these costs did not include additional costs that might be required for the control of nitrogen oxides and radiation.

Justified cost increases are being passed on to the consumer. Thus, it can be assumed the above costs will ultimately be passed on completely to the electric ratepayers through higher electricity rates. Past experience, however, indicates that the passing on may not be complete and in any event will occur with some delay. Furthermore, given the complexity and variety of rate structures, the study was not able to determine how these price increases might be distributed among the various categories of consumers.

Six industries were identified for which electric power costs amounted to 5 per cent or more of the total value of shipments. These are Atomic Energy Commission plants, primary aluminum, electrometallurgical products, alkalies and chlorine, industrial gases, and hydraulic cement. The anticipated increase in the price of electricity was expected to have little impact, even upon these industries.

Pulp and Paper Mills Industry

Approximately \$3.3 billion was estimated to be required in capital expenditures for the period 1972-1976 to meet air and water pollution abatement requirements.

Because of an anticipated tightening of supply/demand balances, price increases were expected in the paper industry. These increases were likely to reflect the above mentioned annual costs of pollution controls. (Annual costs per ton of product were estimated to range from \$5.50 to \$12.50 depending upon product sector.)

Given these increases it was anticipated that most mills will be able to manage pollution control expenditures. However, of the 552 pulp and paper mills in the U. S., 329 (accounting for 15 per cent of U. S. production) have been identified as marginal. These mills currently have profit margins much below industry averages (-7.7 to 4.8 per cent vs 6.6 per cent) and may experience pollution control costs approximately twice as large as industry averages. Price

increases were not expected to cover their increased costs. This will reduce already low profit margins and create some difficulty in raising the capital required for pollution control equipment.

Even in the absence of pollution control requirements, 30-35 of these marginal mills were expected to close in the 1972-76 period. It was estimated that an additional 60-65 mills would be forced to close with the imposition of abatement regulations. These additional closings were expected to result in the loss of 16,000 jobs in 1976. A larger number of jobs will be made available in plants which are expected to expand, but these, of course, may not be in the same community. Many of the shut-downs are likely to be in rural areas where they would have significant community impact.

Petroleum Refineries Industry

From 1972-1976, it was estimated that the petroleum refining industry would be required to make capital expenditures of \$634 million or \$1155 million to meet the air and water pollution abatement requirements that apply to the refining of petroleum. Annual costs of \$2 million in 1972, rising to \$21 million in 1976, would also be required. In addition, the cost of using low sulfur fuels in refinery operations was estimated to be \$108 million annually by 1976.

Because capital expenditure for pollution control equipment would equal only 5 per cent of the \$21.4 billion capital

expenditures otherwise projected for the industry in the next ten manageable, it was estimated that most small producers will be able to sustain added pollution control costs. A few, perhaps twelve, might be forced to close.

If a dozen small refineries do close, approximately 1,000 workers would become unemployed. These small refineries would probably be located near smaller communities, and thus would have a noticeable local impact. Otherwise, industry employment is expected to increase at about the rate projected without pollution control costs.

This study did not take into account a number of major changes likely to occur in the petroleum industry. These include federal requirements for making lead-free gasoline available, restriction of lead content in leaded gasoline, higher average sulfur content in crude oil supplies, and higher market demand for desulfurized residual oil. Further, although environmental regulations will impact almost every aspect of the petroleum industry from exploration through production, transportation and refining to marketing, only the pollution abatement costs related to refinery operations have been estimated. Consideration of the full impact of environmental regulations on the petroleum industry could result in substantial increases in capital requirements and operating costs above those estimated for this study.

Aluminum Smelting Industry

Total investment expected to control the air and water pollution associated with the smelting and refining of aluminum for the period 1972 through 1976 was estimated at approximately \$935 million. Annual costs were estimated to range from \$22 million in 1972 to approximately \$290 million in 1976. Although the required capital expenditures are large, aluminum producers were judged to have the necessary financial resources.

Cost increases are expected to be passed on to consumers of aluminum. Historically, demand for aluminum has been sensitive to price. And the demand for aluminum is expected to grow at a decreasing rate during this period.

It was not expected that pollution control costs will force any existing plants to shut down. No decline of employment in the aluminum industry was expected because of pollution controls. However, the rate of increase in employment will decrease.

Iron Foundry Industry

\$348 million in capital expenditures was estimated to control the air pollution associated with the making of iron casting through 1976. Annual costs of pollution control equipment will increase from \$6.2 million in 1972 to \$125 million in 1976.

This industry is composed of a relatively small number (30 per cent) of large producers whose costs and investment per ton of casting are less than half of the smaller producers. From 1947 to 1969, the total number of foundries has declined from 3,200 to 1,670. Most of these closings have involved small foundries which have been unable to raise capital to modernize. This trend is expected to continue through 1980, with the additional closing of some 670 foundries. It is estimated that approximately 10 per cent or 67 of these closings would be caused in part by pollution control requirements. In an additional 50 per cent of these closings, pollution control costs were expected to be a significant factor.

Total employment loss in all plants projected to close by 1980 was estimated at 26,600. It was expected that approximately half of these (13,000) would be reemployed in other iron foundries, giving a net unemployment of approximately 13,000. For the 60 per cent of the plant closings in which pollution control was expected to be a factor, disemployment would be approximately 16,000 with a net unemployment of 8,000.

It is estimated that about 2,250 of these 13,300 unemployed workers would possess transferable skills. The remainder would be unskilled, and was therefore expected to experience difficulty in obtaining reemployment. Because foundries are

generally located near industrial markets, it was not expected that many communities will be severely impacted by the projected closings.

Copper Smelting and Refining Industry

The capital investment required in the copper industry, because of air and water pollution controls from 1972 to 1976, was estimated to total \$300 million to \$690 million with a most likely estimate of \$341. Annual costs were expected to increase from \$6 million in 1972 to \$95 million in 1976. It is expected that the industry can finance the required capital expenditures.

It was estimated that most existing U. S. smelters will continue to operate under pollution control requirements. Two smelters were identified, however, as being forced to close. No estimate was made of additional smelters which might close.

With the imposition of pollution controls, employment in the copper industry was not expected to decline, but would grow more slowly than the base projections. Without pollution control costs, employment was expected to grow from 54,000 in 1970 to 76,900 in 1980. Pollution control costs were expected to reduce the 1980 employment by 2,800 to 10,900 or 3.6 per cent to 14 per cent depending upon the cost and foreign competition. Where individual smelters close, of course, all

workers would become unemployed. The two smelters identified as closing currently employ 1,150 employees. In both instances, a significant community impact was expected.

Cement Industry

Capital expenditures required from 1972 to 1976 to meet air and water pollution control requirements associated with the manufacturing of cement in kilns and clinker cookers were estimated to total \$122 million. Annual costs were estimated to increase from \$3.0 million in 1972 to \$43 million in 1976.

Projections of cash flow and capital needs including pollution abatement expenditures for the cement industry through 1980 indicated that the industry will be able to meet its cash needs.

Pollution control costs in the cement industry were expected to accelerate the current trend in the industry toward the closing of small, old plants and the construction of large, modern facilities. This in turn would increase the capital pressure upon the industry. The combined effect has been estimated to result in the closing of approximately twenty-five cement plants in the 1972 to 1976 period. There are about 180 cement plants owned by 51 companies in the U.S., located in 40 states. The leading eight companies account for 47 per cent of the capacity. Ownership patterns vary and include divisions of diversified companies, large cement users and independent companies. There is a trend toward increasing

concentration in medium-sized cement producers, with small one-plant companies slowly disappearing. The industry is highly capital intensive with a typical sales-to-fixed assets ratio for a new plant of about 1.2. The additional impact upon cement industry employment was expected to be minimal. Only one possible community impact was identified by the study.

Leather Tanning Industry

Total investment between 1972 and 1976 was estimated at \$89 million. Annual pollution control costs were expected to rise from \$2.1 million in 1972 to \$10.7 million in 1976. This amounts to approximately 2 per cent to 3 per cent at the highest of total sales.

Available financial data and an industry survey were interpreted as indicating that those firms which were not likely to close for other reasons would be able to finance the required capital expenditures. It was estimated that a few small marginal firms might close more quickly because of pollution control costs, but this impact was judged to be slight.

The aggregated effects on employment or production in the leather industry as a result of pollution control costs were estimated to be minimal. The closing of beam houses by some firms was expected to be widely scattered geographically, however, with no important community impacts. Some subsequent increase in employment was expected where the beam house work would be picked up.

APPENDIX M

October 20, 1975

Gentlemen:

In the past decade, a series of acts passed by Federal and state legislatures has stimulated a nationwide effort toward the control and abatement of pollution in our atmosphere and in our land and water resources. New laws are being passed at such a rapid rate that many businessmen find it extremely difficult to stay up-to-date on the legal requirements. Nevertheless, it is of acute importance that businessmen be aware of the social, political, and technological segments of the environment in which they operate. Of special interest to businessmen is the cost to their firm for meeting these legal requirements.

In order to be of service to students and to businessmen in the Environmental Protection Agency's Region VI, I am performing research for the Department of Administrative Sciences and Marketing at North Texas State University to determine the effects and the costs of pollution abatement efforts on selected businesses. Our aim is to develop guidelines which will aid businessmen in their decision-making efforts in the pollution control area.

Accordingly, we will be able to better reach these goals if you will assist us by answering the questions on the enclosed questionnaire. A postage-paid, self-addressed enveloped is enclosed. Your response will remain anonymous.

Upon request, it will be our pleasure to provide you with a copy of the final research report.

Your cooperation in this endeavor is urgently needed and will be greatly appreciated.

Sincerely yours,

Mrs. Mary S. Thibodeaux
Graduate Assistant

mmd

QUESTIONNAIRE

1. Which of the following federal laws have been most difficult for your company to comply with? Air pollution laws Water pollution laws Solid waste management laws
2. Were you required under any environmental laws to add new equipment or to replace old equipment? Yes No If yes, under which law(s) _____

3. If question "2" is answered yes, what were the administrative and capital costs to your firm per year? Please estimate _____
4. Have you been required by the Environmental Protection Agency to file environmental assessments or impact statements for your company or for additions to your company? Yes No
5. How much time did your company spend in the preparation of the assessment or impact statement? 0-3 months 3-6 months
 6-9 months 9-12 months _____
Over one year (please specify the length of time)
6. Who prepared the assessment report? Consultants Personnel within your company Personnel within your company and consultants
7. How were the consultants located? Recommended by the Environmental Protection Agency Personal contacts Industry conferences and contacts Other (Please specify) _____

8. To what extent were consultants used? 0-25% 26-50%
 51-75% 76-99%
9. Were any new organizational structure arrangements made to facilitate the filing of the assessment reports or in other abatement efforts? Yes No If yes, which of the following? _____
 Committees Project Structure New position created
 New Personnel hired for this function

10. Please estimate the administrative costs required to file the Environmental Protection Agency's assessment report. _____

11. Please estimate the costs for your firm for compliance with Federal and state environmental laws in 1976. _____
In 1980 _____

PLEASE ADD ANY COMMENTS YOU WISH TO MAKE

APPENDIX N

ESTIMATED INCREMENTAL POLLUTION CONTROL EXPENDITURES¹

(In billions of 1973 dollars)

Pollutant/Medium	1973		
	O&M ²	Capital Costs ³	Total Annual Costs ⁴
Air Pollution			
Public	0.1	0.1	0.2
Private			
Mobile	1.2	0.2	1.4
Stationary	1.0	1.0	2.0
Total	2.3	1.3	3.6
Water Pollution			
Public			
Federal	0.2	NA	NA
State and local	1.1	0.1	1.1
Private			
Industrial	0.5	0.5	1.0
Utilities	0.05	0.05	0.01
Total	1.8	0.6	2.1
Noise	NA	0.1	NA
Radiation			
Nuclear power plants	NA	NA	NA
Solid Waste			
Public	0.1	0.1	0.2
Private	0.1	0.05	0.1
Total	0.2	0.1	0.3
Land Reclamation			
Surface mining	0.3	0.0	0.3
Grand Total	4.6	2.0	6.3

¹Incremental costs are expenditures made pursuant to federal environmental legislation, beyond those that would have been made in the absence of this legislation.

²Operating and maintenance costs

1982			Cumulative--1973-82		
O&M ¹	Capital Costs ³	Total Annual Costs ⁴	Capital Investment	O&M ²	Total Annual Costs ⁴
0.5	0.2	0.7	1.7	3.8	5.4
8.4	4.9	13.3	31.3	49.9	74.4
4.0	2.3	6.3	16.3	31.2	53.5
12.9	7.4	20.3	49.3	84.3	133.3
0.2	NA	NA	1.8	NA	NA
1.4	1.3	2.7	14.8	12.8	24.4
1.5	1.2	2.6	9.8	12.3	23.1
0.4	0.3	0.7	4.4	2.2	3.5
3.5	2.8	6.0	30.8	27.3	51.0
NA	1.0-1.4	NA	6.0-8.7	NA	NA
0.05	0.05	0.07	0.3	0.08	0.3
0.3	0.1	0.4	1.0	2.2	2.9
0.5	0.05	0.5	0.05	2.3	2.3
0.8	0.1	0.9	1.0	4.5	5.2
1.6	0.0	0.6	0.0	5.0	5.0
18.8	10.4	28.0	81.4	121.8	194.8

³Interest and depreciation

⁴Operating and maintenance plus capital costs

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