

AN EVALUATION OF THE NATIONAL  
ENVIRONMENTAL POLICY ACT  
OF 1969 AND ITS  
IMPLEMENTATION

By

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## CHAPTER I

### INTRODUCTION

As the decade of the 1960's came to a close, a Congressional recognition of a need for an overview policy recognizing environmental concerns was revived. This recognition culminated in the passing of the National Environmental Policy Act of 1969 (1). The basic thrust and language of this Act (NEPA) will be examined in a cursory manner before presenting the objectives and scope of this study.

#### Summary of the Act

NEPA is primarily composed of two portions which are referred to as Titles. Title I sets forth a broad mandate to Federal agencies expressing environmental concerns. Title II establishes the requirement of an annual report by the President to the Congress and creates the organization, duties and functions of the Council on Environmental Quality, hereinafter referred to as CEQ. The text of NEPA is shown in Appendix A.

NEPA begins with a statement of the purposes of the Act. These purposes are:

To declare a national 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 biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality (1, p. 400).

The purposes are followed by Title I which is divided into five sections.

The first section, Section 101, contains national environmental policies and goals. Subsection (a) of Section 101 contains a declaration of a national environmental policy which is stated in broad, general terms. Subsection (b) states in general terms national goals which are to be achieved through implementation of the policy. Subsection (c) recognizes the premise that "each person should enjoy a healthful environment."

Section 102, the second section, is commonly referred to as the "action forcing" portion of the Act.

Subsection (A) broadens the disciplinary scope of the decision-making process to include use of the natural and social sciences. This section emanated from a concern that too often decisions are made with knowledge of a narrow field and unintended consequences occur due to a lack of knowledge in disciplines which had not been represented in the decision-making process.

Subsection (B) insures that "appropriate consideration" be given to environmental amenities. This is to be accomplished by the identification and development of methods and procedures in consultation with the CEQ.

Subsection (C) requires a documentation of certain aspects of environmental decisions in what has been labeled "the environmental impact statement." The purpose of the environmental impact statement is to document consideration of certain environmental amenities. Following the environmental impact statement requirement are provisions for coordinating this statement with other agencies and making it "available" to the President of the United States, CEQ and the public.

Subsection (D) sets forth the requirement to "study, develop and describe" alternatives to the proposed actions where there exists "unresolved conflicts" concerning alternative resource use.

Subsection (E) recognizes the world-wide character of environmental problems and requires consistency with foreign policy when found to be necessary and appropriate.

Subsection (F) requires that environmental information be made available to other governmental entities.

Subsection (G) states "ecological information" shall be initiated and utilized for resource-oriented projects.

Subsection (H) requires assistance by Federal agencies for CEQ.

Title II requires that the President report to the Congress annually, setting forth the status of environmental concerns, trends and programs. In addition, Title II establishes a CEQ which acts in an advisory capacity to the President and the Congress. Preparation of the annual re-

port mentioned above is also listed among the duties of this Council.

In summary, NEPA consists of a broad environmental statement of policy, an "action forcing" provision which requires Federal agencies to do something, the establishment of CEQ to monitor environmental concerns in the Executive Branch and report annually to the Congress on the status of the environment.

#### Purpose and Scope of the Study

The purpose of this study is to evaluate the response of the U. S. Army Corps of Engineers to NEPA. The Corps of Engineers will hereinafter be referred to as the Corps. This evaluation will consist of two parts. First, NEPA will be interpreted, taking into account Congressional intent, the language of NEPA, court interpretations, CEQ guidelines, and Corps regulations. The second portion of the evaluation will consist of a study of the documentation resulting from NEPA and a case study showing the effects of NEPA upon the planning of water resource projects.

There are several aspects of NEPA response which are beyond the scope of this study. First, the role and organization of CEQ as set forth in Title II will not be analyzed in detail. However, CEQ will be discussed to the extent that it enhances the understanding of the results of this study. Secondly, Corps responses for water resource projects which are operational and for actions

taken under the Refuse Act (2) permit program are also beyond the scope of this study.

### Study Summary

Chapter II will contain a review of literature. Much has been written about NEPA so the review will merely highlight literature which does not directly relate to this study, but will discuss in more detail the closely related studies.

The development of a national environmental policy is presented in Chapter III. The evolution of this policy from its inception in Congress to its interpretation by the courts and Federal agencies is analyzed in this chapter.

In Chapter IV, a detailed analysis of the legislative history and court interpretation of Section 102 is shown. However, detailed expansion of Section 102(2)C which pertains to the content of the EIS is deferred to Chapter V.

A study of the documentation required of Federal agencies by NEPA is presented in Chapter V. NEPA requires a "detailed statement" be included "in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment." This "detailed statement" will be referred to as the environmental impact statement or EIS.

Because of the large number of environmental impact statements which have been filed, it is not practical to

evaluate all statements written. For example, as of July 1, 1974, the Corps alone had filed 1063 EIS's (3, p. 390). Another reason for not evaluating all EIS's is that the quality of the EIS has improved since the early stages of implementation of the Act. It would therefore be reasonable to examine EIS's which reflect the highest quality in EIS preparation.

Criteria for evaluating the EIS will be divided into two categories or subsets: procedural and substantive. The word criteria as used here means a standard with which a decision is made.

Procedural criteria are those standards which are used to evaluate the more or less mechanical aspects of responses to the Act. Examples could include consideration of the adequacy of the public notice, of the coordination or of the discussion developed in response to specific language of the Act. A checklist approach is considered appropriate for this portion of the evaluation. A sample of EIS's for projects which were reviewed by the Board of Engineers for Rivers and Harbors during the period from August 1974 through June 1975 was selected for evaluation. Procedures and results of this analysis are shown in Chapter V.

Substantive criteria as used here will be defined as those standards which insure "appropriate consideration" is given to environmental amenities through the use of a systematic, inter-disciplinary approach. Results of

decisions should reflect this "appropriate consideration." Therefore in this part of the analysis, the recommendations as well as the formulative processes used to arrive at the recommendations will be studied to determine NEPA effects. For instance, if a dam site is moved in the formulation process to avoid destruction of habitat for a certain desired species, it is likely that this decision could be traced to "appropriate consideration" of environmental amenities as required by NEPA. "Appropriate consideration" could result in the decision to destroy the habitat in spite of the magnitude of the loss or the impact upon the environment. In either instance, a case by case decision will be made as to whether the spirit of NEPA has been satisfied. Admittedly this determination will be to a degree subjective; however, every attempt will be made to maintain as high a degree of objectivity and rationality as possible.

The case study approach was utilized for this portion of the study. This approach was selected because of the difficulty of managing the study of a large number of projects involved in an agency-wide study or in a study of all water resource projects planned and constructed by the Federal Government. The Tulsa District, Corps of Engineers was selected for the case study. This District offers a wide variety of water resource projects which are in various stages of planning or development. In addition, one of the projects was the subject of a landmark litiga-



tion filed under NEPA. This part of the study is contained in Chapter VI.

Finally, a discussion is presented in Chapter VII; conclusions are shown in Chapter VIII, and suggestions for future study are contained in Chapter IX.

## CHAPTER II

### LITERATURE REVIEW

A search of the literature revealed numerous writings concerning NEPA and its effectiveness. The opinions and conclusions offered in these writings have been rapidly outdated as Federal agency responses have evolved and NEPA effects varied. Because of the evolutionary nature of this response to NEPA, the literature will be reviewed in chronological order.

One of the first reports concerning NEPA was published by the National Water Commission (4). The Commission contracted for reports to provide background for the Commission's deliberations on the subject of national water policy. One such report was developed for the purpose of seeking new institutional devices which might be used to balance environmental and developmental values with respect to water resource projects. An evaluation of NEPA was considered as basic to the consideration of these new institutional devices. In regard to NEPA, the Commission stated:

We consider an institutional arrangement a good one if it tends to develop the information which a politically responsible decision-maker needs to make a full, fair, and expeditious evaluation of all relevant issues and to strike an appro-

ropriate balance among the relevant factors. Judged in this light, NEPA has considerable merit (4, p. 36).

Although the above generalization was made concerning NEPA, two criticisms were recognized. First, uncertainties surrounding the implementation of NEPA have caused delay and confusion. Secondly, the fact that NEPA does not create a superagency was conceded by the Commission to be considered a weakness by some; however, the Commission considered this feature of NEPA a strength. The reason for this opinion was not offered explicitly, but can be inferred from their view that environmental decisions should be made by the politically responsive Congress.

Six specific recommendations were made regarding the evaluation of environmental amenities. These recommendations resulted from a case study of eight water resource projects where environmental issues were major factors in the project evaluations. The six recommendations by the Commission are as follows:

1. Congress should continue to make the choice among conflicting developmental and environmental values with respect to water projects.
2. Congress should require agencies to provide adequate opportunity for public participation.
3. Congress should direct that EPA or alternatively a new, independent agency act as an advocate of environmental values in the development of project proposals.
4. Congress should institute procedures to allow interested parties to question the adequacy of the agency's compliance with NEPA prior to authorization and funding. In addition, NEPA should be amended to make Congressional action the final determinative factor for resolution of environmental issues.
5. The Executive Branch should improve its

evaluation of environmental amenities in federal water projects prior to preparation of the annual budget.

6. Congress should exercise control over projects entering the construction stage by limiting authorizations, instituting a deauthorization process, and subjecting it to environmental evaluation processes proposed in No. 4 above (4, p. 52).

In another one of the earlier writings concerning NEPA, Andrews (5) was critical of the Act when he stated: "A serious deficiency of the present Act is its requirement of environmental impact statements only for recommended proposals" (5, p. 262). It was his view that EIS's should be generated for all alternatives to the proposed Federal action. For water resource projects, present planning processes include an evaluation of alternatives to proposed actions. Part of this evaluation is made up of environmental impact assessment for all reasonable alternatives including the "no action" alternative. This part of the evaluation is included in the EIS. In effect, impacts of all reasonable alternatives are included in the one statement for the proposed Federal action. Therefore his statement appears to be either outdated or inaccurate.

Andrews recognized the value of the public involvement with the EIS, but indicated the Act made no provision for preventing environmental deterioration through the cumulative effect of small incremental impacts by a series of projects which individually have little impact on the environment.

Andrews also discussed the evaluation of environmental

costs and benefits in association with the economic costs and benefits. He recognized the then-existing conflict in higher levels of government in deciding on an evaluation procedure for both environmental and economic costs and benefits.

Another early publication addressing the issues of NEPA and the adequacy of its implementation evolved from an environmental conference held at Green Bay, Wisconsin, January 4-5, 1972 (6). Participants of the conference voiced a number of opinions and conclusions regarding NEPA and its resulting documentation, the EIS. Nine of the presentations are reviewed in the following paragraphs.

In regard to the law (NEPA), Winters (7) characterized it as a piece of legislation with quite a broad mandate, just as our Constitution. In addition, he stated we can expect controversy since decisions under NEPA will involve resource trade-offs, great financial costs and value judgments.

Difficulties in implementing NEPA were set forth by Orloff (8) who addressed such problems as the generality of administrative regulations, publication requirements for the "no action" plan and the lack of specificity in the EIS. In regard to the EIS, Orloff states:

The majority of the impact statements are too superficial. They lack the breadth and depth of analysis appropriate for an understanding of the effect on the environment of the proposed action (8, p. 33).

No supportive evidence was presented for his position

on this matter. In addition, Orloff suggests that a conceptual framework be established by Federal agencies. This proposed framework would avoid the dilemma associated with having too broad or too narrow a perspective. Too broad a perspective compounds the complexities of the analysis to an unmanageable level while the other extreme having "too narrow" a perspective might cause oversight of the cumulative effects of individually small projects.

The impact of NEPA upon the Corps of Engineers Civil Works program was presented by Lawyer (9). In regard to the EIS, Lawyer made the following statement:

The EIS is not the decision document. Generally the EIS is based on data and information developed for the study and contained in the project report. Rarely will new and original data be developed for the EIS (9, p. 56).

In regard to the quality of reviewed EIS's, Lawyer stated:

Some of these are quite good and others are not so good, especially those we prepared and filed in the middle and last half of 1970...since the Council's (CEQ) "Proposed Guidelines" were issued in February...there has been a marked improvement in coverage, content, depth, and applicability of Corps statement (9, p. 56).

To highlight the emphasis given to environmental considerations since the enactment of NEPA, Lawyer listed some changes induced by the Act upon Corps projects. His list was one of the first published showing the impact of NEPA upon Corps of Engineers water resource projects. A summary of his list is as follows:

- (1) Duck Creek Channel Improvement Project, plus San

Antonio, Elm Fork and Fort Worth Floodways. Modified in design to include reflecting pools, greenbelt trails and other esthetic improvements.

(2) Big Walnut Reservoir, Indiana. Moved dam site.

(3) Oakley Reservoir, Illinois. Elimination of downstream channel and substitution of greenbelts.

(4) Morrison Creek, California. Provision of open space to save unique wildlife habitat.

(5) LaFarge Reservoir, Minnesota. Installation of multiple-level outlet to create a new trout fishery downstream.

(6) Red River Reservoir, Kentucky. Moved dam five miles downstream to preserve a valuable and unique scenic gorge.

(7) Columbus Lock and Dam, Mississippi. Moved dam site upstream to protect valuable paleontological site. Corps has recommended the site be registered as a National Nature area.

In addition, Buffalo Bayou, the Florida Gulf Intra-Coastal Waterway and the Jack and Siummerly Sloughs projects were cited as projects terminated because of NEPA.

NEPA impacts were discussed by Armstrong (10) who suggested moving beyond NEPA by expanding the definition of environment, thus increasing the concept of assessment, developing tools necessary for proper environmental assessment and increasing public involvement. Increased public involvement was to be obtained by establishment of a

citizens review council outside of the government bureaucracy.

Cook (11) indicated concern over the question of whether or not the content of the EIS will really be significantly reflected in the actual projects that are built. He speculated that EIS's would contain jargon that would be interpreted as evidence of proper environmental planning; however, his concern centered on the idea that a gap could exist between intentions promulgated in the statement and what could actually happen when the proposed action is taken.

Social aspects of environmental impact were discussed by Johnson (12) who recommended three major social variables be considered in impact analysis. These included life styles and behavior patterns of the people affected, the quality of life, and the attitudes and opinions of the people affected by a given proposal. According to Johnson these variables can be quantified through use of measurement techniques such as randomly selected opinion surveys and observation of social behavior under appropriate conditions.

The application of mathematics to environmental impact analysis according to Robkin (13) will fall short of the required scope of analysis. Quantification of all environmental amentities was the basis for his concern. In regard to this shortcoming of the mathematical approach Robkin stated:



The mathematician and the computer cannot yet, if ever, substitute for the kinds of political, moral, ethical and biological determinations that you are being called on to make (13, p. 94).

With this statement, he recognized the inadequacy of the state of the art at that time and expressed doubt as to whether it would ever be adequate per se to satisfy NEPA requirements.

A computer modeling process was demonstrated by Krauskopf and Bunde (14). This process included information storage and retrieval and quantified impacts on land use by alternative corridor selections for a highway segment. For this system to be effective all impacts would have to be quantifiable. As indicated by Robkin, many are not. This limitation was also recognized by Jewett (15) when he stated that the interaction of ecosystems, our economic system and our political system are beyond our present means of description.

Use of a matrix as a scheme for impact evaluation was discussed by Sorenson (16). The need for more sophistication in the matrix was indicated when Sorenson stated:

It is quite apparent that future impact statements will have to consider a much larger scope of environmental issues as well as extend their coverage to social, economic and political considerations (16, p.100).

In general, participants in the University of Wisconsin Conference provided predictive generalizations because at that time the implementation of NEPA had not really matured to the extent where a detailed evaluation could be

instigated. Those who spoke of the EIS, spoke of inadequacies and shortcomings, but most spoke optimistically of the future potential of the law.

In 1972, Ortolano and Hill (17) prepared a report for the Institute for Water Resources, which presented the results of the study of 234 environmental statements which had been filed by the Corps of Engineers through August 1971. The reported results of the study included a cataloging of various aspects of the EIS. They concluded that:

The majority of the 234 environmental statements that we examined were decidedly less than adequate. They were, in general, not comprehensive, nor did they seem to be written with the view of providing non-technically oriented readers with the kinds of insights and information that would be required if they were to participate effectively in the decision-making process (17, p. 110).

In addition, they observed that the implementation of NEPA is an evolving process as evinced by the inspection of environmental statements. They found the later statements to be longer, slightly more complete, and somewhat more carefully written.

However, most improvement was traced to projects involved in litigation or where allegations of violations of NEPA had been a basis of the lawsuit.

Ortolano and Hill also offered specific observations, criticisms and suggestions. The specifics were divided into three groups: description of impacts, section-by-section analysis, and miscellaneous issues.

They suggested when describing impacts there should be a reduction in generality. The generality issue resulted in two unwanted results; difficulty in conveying impact descriptions to the decision maker and lack of understanding by the general reader. For example, such descriptions as "loss of wildlife," "elimination of vegetation" and "alteration of aesthetics" do little to aid the decision maker in evaluating these impacts. Also, the reading of these generalized descriptions would provide the reader little or no idea of the real nature and extent of these impacts.

The report indicated that identification of impacts was often incomplete. Particular concern was expressed for impacts on the environment by spoil disposal, water quality impacts and secondary or indirect impacts. Spoil disposal was often omitted for projects involving dredging and only 20 percent of the projects involving dams and impoundments of water even mentioned potential impacts upon water quality. Less than half of the EIS's discussed secondary impacts even though this type of impact is specifically required by CEQ guidelines and Corps regulations.

Another problem area identified by Ortolano and Hill was the identification of speculative and controversial arguments. Speculative impacts were defined as those which are not obviously true, yet these impacts were presented in the statement without qualification; and controversial impacts were defined as those which are questioned

by agencies or individuals reviewing the statements. An example of a speculative impact was presented in connection with a coastal project. In the EIS, it was argued that proposed groins would create underwater surface areas for minute microorganisms. These microorganisms, serving as food sources, would attract significant quantities of both inlet and ocean (fish) species, which in turn would attract anglers. According to Ortolano and Hill, while the statement might be true, it was not obviously true and it therefore should have been documented by making references to literature or personal communications. In regard to controversial impacts, it was observed that dissenting opinions of other agencies were relegated to the final portion of the EIS which summarized the coordination of the statement. Ortolano and Hill suggested a reiteration of this dissenting viewpoint be shown in the EIS where the impact is mentioned.

Also, according to their report, the discussion of uncertainty of impact forecasting in the statements was uniformly inadequate. The authors suggested application of probability theory and a more forthright approach to impacts which are impossible to predict with accuracy, given the present state-of-the art. A statistical approach would in their view provide information concerning the level of confidence in the forecasts that are used to predict future environmental impacts.

The Corps' regulation (18) in effect during the study

period required that recipients must be identified. By this, the regulation meant identification of the recipient of project effects plus the nature and extent of these effects. The regulation distinguished between impacts and effects by stating that impacts are value free and effects are defined by who or what is affected by the change. In the 234 statements studied, Ortolano and Hill observed that only rarely were the recipients identified and then only by inference in most cases. They viewed identification of recipients as a very important aspect of the statement and was of the opinion that much more information should be provided to aid the decision-maker evaluate beneficial and adverse impacts of the project.

The identification of value judgments was another deficiency discussed in the report. Ortolano and Hill were not as concerned about the use of value judgments as they were concerned with the identification of such judgments when resort was made to their use. Such failure to recognize and identify value judgments was demonstrated by the fact that 35 percent of the statements involving dams and reservoirs reported that implementation of the project would enhance aesthetic values at the project site. Obviously, some persons would prefer a natural flowing stream, yet the EIS's presented only the opposite viewpoint. According to the report, the judgment should have been identified as a value judgment or the decision as to whether or not the impact was aesthetically beneficial

should have been left to the readers.

The second group of specific observations and suggestions included a section-by-section analysis of the sections which are required by NEPA and pertinent regulations to be included in the statement.

Project descriptions were found to lack dimensions which make impact evaluation difficult for the reader. In addition, Ortolano and Hill found a need to describe the project in layman's terms. In this regard it was suggested a glossary of technical terms might be useful. Finally, a need for completeness of project descriptions was indicated.

The description of environmental settings without the project was found to be somewhat misdirected. In some instances regional aspects were ignored where their importance was obvious and in other instances a detailed description of the project site was overlooked and irrelevant regional impacts described. It was suggested better judgment be utilized in deciding which approach should be taken when describing the environmental setting without the project. Finally, future environmental settings without the project were uniformly omitted. The authors viewed this information as essential to the decision maker.

Environmental impacts and adverse effects to a certain extent have been discussed; however, the report indicated causal connection between impacts and individual components or activities of the project in many cases were lacking. It was suggested that impacts be listed with the

individual structures or activities. If the impacts cannot be associated with a component or activity, they should be listed under a general category of "project-induced impacts."

In regard to the alternatives section, criticism was made of a lack of environmental considerations and of a frequent writing-off of alternatives for economic infeasibility.

The next section normally requires a showing of the relationship between short-term uses of the environment and long-term productivity. A wide variety of responses was found which according to the report indicates no one really knows what is called for.

The section which provides irreversible and irretrievable commitments of resources was found in most cases to be too general. Further elaboration was suggested; however, the report questioned whether mere elaboration would be sufficient to comply with the spirit and intent of the law. It was suggested that efforts be directed to address the real point in this section, "...the extent to which the action curtails the range of beneficial uses of the environment."

The final section covers coordination with other agencies. The authors viewed this section as potentially one of the most useful components of the environmental statement. Considerable improvement in agency responses was observed; however, much more improvement was con-

sidered necessary before this important section reaches its full potential.

Under miscellaneous items, Ortolano and Hill gained the impression that EIS writers viewed the term wildlife to be synonymous with game. The impression of the narrow definition came from a listing of wildlife species which included only those species which are hunted for game. Game is narrower in definition and includes only wildlife which is useful to man. It was suggested that the listings be broadened to include more than animals which traditionally are considered to be of value to man.

As a final suggestion, the report indicated that impact analysis should be extended to include alternative operating policies of the projects. Presumably they were considering such things as seasonal pool operations in reservoirs which are normally not considered in the Corps earlier stages of the planning process.

In 1972, Andrews (19) wrote a dissertation on the subject of environmental policy and administrative change. The study involved a comparison of the effect of NEPA upon four Federal programs: the United States Army Corps of Engineers (the Corps), the Small Watershed Program of the Soil Conservation Service (SCS), the Tennessee Valley Authority (TVA), and the Atomic Energy Commission (AEC). The results of the study showed both similarities and differences among the agencies in both NEPA interpretation and in NEPA implementation.



Insofar as the differences were concerned, three conclusions were reached.

First, NEPA contains enough ambiguities to permit differing interpretations. These ambiguities have been, in his words, exploited by different agencies even within the same realm of Federal activity. Agencies have differed in their use of NEPA as new authority to add environmental impacts to the more traditional considerations; in their application of the law to pending action; in their definitions of significant environmental impacts; in their extent of incorporating the EIS into the planning process; and in their implementation of public involvement aspects of the law.

Secondly, the differences above stem from contrasts in the agencies' political environment such as their relationships with their constituents and clients. To substantiate this conclusion, Andrews indicated that of the four agencies studied, the Corps is most vulnerable to changes in the public attitude and to legal attacks. This vulnerability resulted from the fact that politically the Corps has the image of being an environment modifier and the recipient of "pork" in the Federal budget. In contrast, the SCS is insulated by the fact that it is legally sanctioned in most of its activities and it does not deal with those whom it disbenefits. TVA was cited as being immune from virtually any control on public involvement except through Congressional subcommittees largely because of the fact that TVA is

a quasi-public corporation. The AEC has the advantage of having a monopoly of technical expertise on its very specialized mission as well as a pre-emptive jurisdiction over its subject matter. Andrews concluded the more insulated the agency, the more limited and conservative the agency was in NEPA interpretation.

The third conclusion evolved from the idea that NEPA basically has two action-forcing mechanisms, interagency review and public review. SCS reactions were found to result mostly from adverse comments of other Federal agencies and its own internal re-evaluation; but in the cases of TVA, the AEC, and the Corps, more adverse comments originated from non-federal sources such as state and local agencies and adverse court decisions. Andrews viewed non-federal involvement as being the most effective in bringing about administrative change and stressed the importance of the entry of new groups into this decision-making coalition.

In summary, Andrews concluded this portion of his study with the following statement:

In summary, NEPA appears to be a crude instrument for amelioration of the problems that gave rise to it. It is hardly the "plan" one would have chosen as optimal from among alternative plans to improve the coordinated management of the human environment (19, p. 462).

But he admitted the purposes of NEPA probably could not have been enacted by frontal challenges to the priorities of the existing agencies.

Further progress will require: first, preservation of the broadened legal recourse secured by NEPA; second, development of a more sophisticated framework for the systematic evaluation of environmental impacts and alternatives; third, more explicit means of identifying, comparing, and trading off conflicting objectives; and finally, development of more effective public involvement in planning and the decision-making process.

Two possible sources of future change in NEPA were considered worthy of mention. First, in 1971 and 1972 several attempts to amend NEPA were thwarted, but Andrews considered this possibility as real, and an Achilles heel to the litigative approach to an administrative change. In addition, Andrews envisioned the possibility that adoption of the Water Resources Council, Principles and Standards might be considered to supplant the need for NEPA. The causative effects of administrative change in the view of the author might be removed at least to a degree if such a substitution were made. For this reason caution should be used when instituting such a change. Finally, Andrews concluded:

If federal planning and decision-making are to be responsive to the needs and preferences of the people affected by them, rather than left to the discretion of the agencies, it is imperative, first, that the resources secured by NEPA against narrowly conceived plans be maintained; second, that representatives of all major conflicting uses have opportunities for early and continuing involvement in the choices that are made among alternative plans; and finally, that better planning processes themselves be evolved within the

agencies, to provide more effectively for the full range of demands upon environmental and other resources (19, p. 471).

Finn (20) also wrote a dissertation, analyzing the Congressional processes involved when conceiving, developing and passing NEPA. The main thrust of the analysis was aimed at the legislative process and therefore is not germane to the subject of this dissertation. However, the legislative history of NEPA is very complete and will be referred to as a source of information in developing an interpretation of NEPA as defined by legislative history and intent.

In 1973, Resources for the Future, Inc., published an analysis of NEPA in the courts authored by Anderson (21). The purpose of the study was to trace the way in which the courts had interpreted NEPA at that time. No attempt was made for a complete evaluation of the operation of NEPA such as the completeness or quality of agency compliance as revealed in procedures or individual impact statements. Also, impacts of NEPA on the Federal decision-making process were beyond the scope of the work although this aspect could not be totally divorced from the analysis of court interpretations.

Anderson concluded as follows:

If the standard is the extent to which litigation has achieved NEPA's ultimate goal of a better environment through better federal decision-making, then apparently the cases that we have discussed have not accomplished very much. If a lesser standard is acceptable, litigation has accomplished a great deal. The courts have strictly en-

forced NEPA's procedural requirements and have gone a long way toward ensuring that adequate agency decision-making machinery exists so that better substantive results may be obtained in the future (21, p. 292).

He concluded further that very few instances of NEPA having materially altered a Federal program or project have been offered, yet Federal agencies have give NEPA much attention. In his opinion this attention is somewhat superficial.

Anderson discussed at length the Calvert Cliff's Court decision (22) which is the landmark case interpreting NEPA. In regard to this case Anderson stated:

The decision in Calvert Cliff's has been read to imply that the impact statement should include at least some discussion of how costs and benefits were balanced. But, as discussed above, the court was using 'cost benefit' language loosely and did not seem to mean that cost-benefit analysis or techniques should be transferred into the 102 process (21, p. 254).

However, Kessler and Berlin (23) had a different view on this matter. In regard to Anderson's statement, they stated:

We find no justification for such a restrictive reading of Calvert Cliff's. Rather we can only conclude that the court chose its phraseology with extreme care, and meant exactly what it said when it called for a 'case-by-case balancing judgment on the part of Federal agencies' in which the 'particular economic and technical benefits of planned action must be assessed and then weighed against the environmental costs' so as to ensure 'that the optimally beneficial action is finally taken'(23, p. 213).

This conflict in opinion will be discussed further in Chapter IV which includes judicial interpretations of NEPA.

Anderson summed up his conclusions by stating that the

first three years of NEPA have resulted primarily in procedural compliance with the Act which has caused more adequate disclosure of environmental impacts, and in some instances has instigated useful debate on these issues. Also, NEPA has made a beginning toward Federal decision-making for environmental matters.

In 1973, Smith (24) authored a paper concerning environmental policy and impact analysis. His study covered several aspects of NEPA and its application to the government decision-making process.

The first part of the analysis involved an examination of the main provisions of NEPA Title I and a determination of the main structural interrelationships of the law. The policies and goals in Section 101 were found to offer virtually no guidance for the administrative agencies as to how the specific goals are to be constructed and evaluated in their decision-making procedural requirements set out in Section 102. The standard of compliance "fullest possible extent" was found to impose very stringent duties on all Federal agencies.

In regard to the role of NEPA within the framework of national policies, Smith concluded:

The foregoing analysis suggests (a) that the substantial NEPA mandate, 'must be construed by rules of reason in the light of many other relevant statutory programs' and (b) that excessively rigid interpretations of the procedural requirements could eventually impair the pursuit of many different program objectives (including the NEPA goals themselves) (24, p. 14).

A study of litigation under NEPA was conducted with a view to define and interpret the duties of agencies to (a) disclose all pertinent information; (b) consider opposing views; (c) identify alternatives; and (d) balance competing interests. In conclusion, it was found that additional clarifications are needed by the courts. Precisely what is expected by the agencies is at best uncertain. Solutions to such problems have thus far eluded the reach of modern science and may lie beyond the present competence of the legislature or the judiciary. It was further concluded that the courts should not exercise equitable powers loosely or casually whenever a claim of "environmental damage" is asserted. He quoted Justice Burger as saying that there is a need for flexibility and balance in the judicial interpretations as "the world must go on and new environmental legislation must be meshed with more traditional patterns of Federal regulation" (25, p. 1218).

The latter portion of the report covered the evolution of judicial control over selected Federal environmental programs. Such subjects as standing to sue, and specific Federal programs were commented upon but won't be covered here as they have little applicability to the ultimate topic of this dissertation. However, the scope of review is worthy of further treatment at this point.

Smith categorized issues raised judicially under NEPA under two general headings. On one hand, these issues are considered procedural. Issues such as the adequacy of

agency coordination, the EIS adequacy, the timeliness of the EIS filing and the adequacy of discussion of all of the Section 102 requirements fall under this broad category. On the other hand, issues under NEPA can be considered substantive. For substantive issues, the court would look at the bases for the agency decision. The following questions would typify this issue. How were the costs and economic benefits derived? How valid is the environmental assessment? Were proper predictive techniques used in forecasting impacts? As stated by Smith, there is some reluctance by the courts to enter this realm; however, depending on the jurisdiction involved, there is some degree of entry. He finished by concluding that in the ordinary type of NEPA litigation, some reasonable grounds appear for expectations that the courts may exercise the ordinary restraints in reviewing the merits of agency actions despite the arguments of many environmentalists that the scope and intensity of review should be increased. However, at this stage in the evaluation of the law, such questions are speculative and uncertain particularly as they bear upon the future role of NEPA in Federal environmental affairs.

Criteria for environmental impact review were developed by Enk (26). He also divided the criteria into two general groups, procedural and substantive. For the procedural, he developed a detailed checklist. For the substantive criteria he emphasized three concepts, the need



for a systematic approach, the need for an interdisciplinary approach and the requirement of full disclosure. Enk concluded:

The law implies a systematic approach to analysis, not a linear presentation of factors...the decision maker is required to move beyond narrow single discipline criteria...the goal is not to place ecological factors above economic or vice versa, but rather to seek an optimum solution for the system over time (26, p. 88).

## CHAPTER III

### THE DEVELOPMENT OF A NATIONAL ENVIRONMENTAL POLICY

This chapter is devoted to defining and clarifying as much as possible the national environmental policy set forth in NEPA. A precise meaning of the policy cannot be obtained; however, understanding of the policy which constitutes Section 101 can be enhanced by the study of the legislative history, court decisions and administrative guidelines and regulations. This enhanced understanding will in part provide a standard with which to measure the adequacy of Corps compliance with NEPA.

Policy, in a legal context, means general principles by which a government is guided in its management of public affairs (27). The word has been in use for some time; however, a specialized use of the word, that is "national environmental policy" began to emerge in the decade of the 1960's.

The Resources and Conservation Act of 1960 (28) was the first legislative attempt to establish a national policy on what we now call the environment. However, this bill did not contain the word environment. It was authorized by Senator James E. Murray of Montana, Chairman of

the Senate Committee on Interior and Insular Affairs, as Senate Bill 2549 (S. 2549).

The purpose of the Act is "to declare a national policy on conservation, development, and utilization of national resources" (28, p. 15980). This policy was stated as follows:

The Congress hereby declares that it is the continuing policy of the Federal Government...to use all practicable means, including coordination and utilization of all its plans, functions, and facilities, for the purpose of creating and maintaining...conditions under which there will be conservation, development, and utilization of the natural resources of the Nation to meet human, economic, and national defense requirements, including recreational, wildlife, scenic and scientific, values and the enhancement of the national heritage for future generations (28, p. 15980).

Although the policy statement differs from NEPA, the 1960 proposal marked the beginning of attempts to establish a broad overall policy to conserve natural resources and it expressed the same concern as NEPA for future generations.

The Resources and Conservation Act of 1960 failed to become law; however, its supporters included Senator Henry M. Jackson of the Interior Committee and Senator Jennings Randolph of the Committee on Public Works who were later to become chairmen of their respective committees and play an active role in the development of NEPA.

As the decade of the 1960's progressed, the word "environment" became popular. Webster's Dictionary (29) defines environment in several ways. It can be defined as

the circumstances, objects, or conditions by which one is surrounded. In the natural context it means the complex of climatic, edaphic and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival. In a social sense it means the aggregate of social and cultural conditions that influence the life of an individual or community. All these definitions are included in the use of the word environment in NEPA; however, two additional concerns were raised in the 1960's which add to the meaning of environment in the NEPA context.

These concerns were expressed in a 1962 report (30) of the Committee on Natural Resources of the National Academy of Sciences where the Committee stated:

Perhaps the most critical and most often ignored resource is man's total environment. Increasing awareness of the importance of understanding the balance of nature is reflected in the gradual development of interest in ecological studies... The wisdom of examining environment in totality of its interaction with man becomes increasingly apparent in the view of the rapidity of environmental change in our country...(30, p. 18).

The key words expressing these concerns are "interaction" and "totality." First, he is suggesting the need for knowledge of the interaction of man with his environment and secondly that the total environment should be considered when environmental decisions are being made. These concepts were considered in the formulation of a national environmental policy and eventually became a part of the policy statement in NEPA.

In June 1968, the Subcommittee on Science, Research and Development of the House Committee on Science and Astronautics published a report entitled "Managing the Environment" (31) which expressed the need for an overall policy to unite government decision-making in regard to environmental matters. This report was written by Richard Carpenter, a staff member of the Subcommittee. Carpenter began his report with an historical resume of environmental quality issues, but his discussion centered quickly on a problem of the day. In this regard he stated:

A major lesson is being taught today on the relationship of man and his environment. It is the lesson of systematic ecology or the 'web of life.' The interdependency of all living things and the environment is so complex that the 'cut and try' or reactive practical approach to nature has been the only possible method for centuries (31, p. 12).

The lack of a comprehensive approach to this problem was stated as follows:

The web of life is a single system but it is dealt with in segments, out of necessity. This fragmented approach is due to the practical aspects of localized environments and short time periods (31, p. 15).

He also indicated in the following statement that the market place does not consider environmental values:

The market approach fails for two reasons: First, it is very difficult to quantify in dollar terms many of the values of environmental quality. Second, the axiom that a unit of profit is more valuable now than at any time in the future leads to short-sightedness in environmental management (31, p. 15).

This was followed by the suggestion of a new basis for an

environmental policy:

The new basis for policy is in addition to existing bases. It is an increased ecological understanding plus the analytical approach for coping with large complex systems. Systematic ecology attempts to replace mystique and lore with facts, mathematical models, and computerized manipulation in order to evaluate alternative actions (31, p. 15).

Carpenter then recommended that a national policy of the United States for the environment be developed by both governmental and private sector interests and that it should contain the following elements:

- a. Use of the environment for the benefit of all mankind;
- b. Maximized productivity of the environment consistent with continued usage into the very long-term future.
- c. Systematic management of applied science and technology to achieve best usage;
- d. Incentives to industry, land developers and local governments;
- e. International agreement on projects which have widespread or long-term effects;
- f. Anticipatory assessment of new and extended applications of science;
- g. Avoidance of speculative statements and emotional appeals in public relations;
- h. An increased education and information program for the public in ecological principles (31, p. 7).

In July 1968, the Senate Committee on Interior and Insular Affairs published a report by Lynton Caldwell entitled "A National Policy for the Environment" (32). This report focused attention on the need for a national environmental policy, the scope of the policy and the contents of the policy. This report was written in response to a request from the Interior Committee and was sponsored by Senator Henry M. Jackson.

Caldwell's report first described the requirements of an effective environmental policy. In this regard he stated:

Effective policy is not merely a statement of things hoped for. It is a coherent, reasoned statement of goals and principles supported by evidence and formulated in language that enables those responsible for implementation to fulfill its intent (32, p. 96).

Effective policy was further described as follows:

To make policy effective through action, a comprehensive system is required for the assembly and reporting of relevant knowledge; for placing before the President, the Congress and the people, for public decision, the alternative courses of action that this knowledge suggests (32, p. 104).

It is interesting to note that in this statement, Caldwell also recognized the need for public involvement when making environmental decisions.

One important aspect of the environmental policy is the role of the policy. Should the policy stop all development which adversely effects environmental amenities? Apparently not, as something less than a preservation stance was intended as is shown in the following statement by Caldwell:

Environmental policy should not be confused with efforts to preserve natural or historical aspects of the environment in a perpetually unaltered state. Environmental quality does not mean indiscriminate preservationism, but it does imply a careful examination of alternative means of meeting human needs before sacrificing natural species or environments to other competing demands (32, p. 108).

From the above language, as well as that of NEPA, it

appears the role of the policy is to require a balancing of the environmental needs of man with the economic and other developmental needs when the two come into conflict.

According to Finn (20, p. 257), the policy statement by Caldwell was designed to stand on its own merits and Caldwell expected it to be adopted by a joint Congressional resolution. The pertinent portion of Caldwell's environmental policy statement is as follows:

It is the intent of Congress that the policies, programs, and public laws of the United States be interpreted and administered in a manner protective of the total needs of man in the environment. To this end, the Congress, proposes that appropriate legislation be adopted and, where necessary, that administrative arrangements be established to make effective the following objectives of national policy for the environment:

- (1) To arrest the deterioration of the environment.
- (2) To restore and revitalize damaged areas of our Nation so that they may once again be productive of economic wealth and spiritual satisfactions.
- (3) To find alternatives and procedures which will minimize and prevent future hazards in the use of environment-shaping technologies, old and new.
- (4) To provide direction and, if necessary, new institutions and new technologies designed to optimize and to minimize future costs in the management of the environment (32, p. 127).

This report containing this policy statement plus Richard Carpenter's report entitled "Managing the Environment" (31) formed the basic documents for a joint House-Senate colloquium to discuss a national policy for the environment. The colloquium was held in July 1968 and represented a joint effort of the Senate Committee on



Interior and Insular Affairs and the House Committee on Science and Astronautics.

Following the colloquium a Congressional White Paper was written by Richard Carpenter and Wallace Bowman (33). This paper was a review and discussion of the colloquium, and it contained the following policy statement:

It is the policy of the United States that:

Environmental quality and productivity shall be considered in a worldwide context, extending in time from the present to the long-term future.

Purposeful, intelligent management to recognize and accommodate the conflicting uses of the environment shall be a national responsibility.

Information required for systematic management shall be provided in a complete and timely manner.

Education shall develop a basis of individual citizens understanding and appreciation of environmental relationships and participation in decision making on these issues.

Science and technology shall provide management with increased options and capabilities for enhanced productivity and constructive use of the environment (33, p. 15).

This proposed policy statement contained some of the elements of the policy contained in NEPA; however, it was not included in the next sequence of events.

In 1969, both the House and the Senate had bills before them which were forerunners to NEPA. Congressman Dingell (34) introduced House of Representatives bill 6570 (H.R. 6570) on February 17, 1969 to amend the Fish and Wildlife Coordination Act. This bill contained a short statement on environmental policy and created a Council on

Environmental Quality. The next day, Senator Jackson (35, p. 3698) introduced S. 1075 which was a forerunner to NEPA in the Senate. S. 1075 authorized the Secretary of Interior to conduct ecological research and created a Council on Environmental Quality. Although Senator Jackson had been active in pursuing a national environmental policy in 1968, his 1969 proposal did not contain a policy statement. According to Andrews (19, p. 84) and Anderson (21, p. 5), both Senator Jackson and Congressman Dingel may have omitted the expanded policy provisions in order to insure the jurisdiction of their committees over their respective bills. However, Senator Jackson's decision to add a policy statement and to promulgate an effective policy as previously discussed by Caldwell can be traced to the testimony given at The Hearings on S. 1075 (36).

On April 16, 1969, Caldwell testified to the Committee on Interior and Insular Affairs as follows:

It would not be enough, it seems to me, when we speak of policy, to think that a mere statement of desirable outcomes would be sufficient to give us the foundation we need for a vigorous program of what I would call national defense against environmental degradation. We need something that is firm, clear and operational (36, p. 116).

In reply to Caldwell, Senator Jackson stated:

I have been concerned with the inadequacy of the policy declaration in the bill that I have introduced. Obviously this is not enough (36, p. 116).

Six weeks after this statement, Senator Jackson introduced an amendment containing "a declaration of national environmental policy" (36, p. 206). According to Finn (20,

p. 424), the statement of policy was drafted by William Van Ness, Special Counsel on the staff of Senator Jackson. Van Ness was familiar with the work of Caldwell, Carpenter, and Bowman. This fact plus the similarities in the policy provisions by Van Ness and those offered by Caldwell and Carpenter suggest that Van Ness drew heavily from their concepts when writing the policy. The full text of the amendment to S. 1075 (36, p. 206) is shown in Appendix B. After a few minor changes, S. 1075 was passed by the Senate and referred to the House for further action.

As stated earlier, Congressman Dingel had introduced H.R. 6750 (34) as an amendment to the Fish and Wildlife Coordination Act which contained a short policy statement and established a Council on Environmental Quality. In the summer of 1969 Congressman Dingel held hearings on H.R. 6750 (37); and after a few insignificant changes, the bill was renumbered H.R. 12549 and on September 23, 1969, was passed by the House (38, p. 26590). Before passing the House, H.R. 12549 was amended several times, but only two of the amendments were of consequence. First, the scope of the Act was broadened by removing the bill from its amendatory status to the Fish and Wildlife Coordination Act and making it a separate Act applying to all types of environmental concerns. The second amendment changed the relationship of NEPA to existing agency statutory authority. This change related more to the provisions of Sections 103 and 104 and is not considered significant.

After passage of H.R. 12549, the House substituted its language into S. 1075 and returned it to the Senate for a conference to resolve the differences. The main contribution of H.R. 12549 to NEPA is contained in Title II and therefore is beyond the scope of this study.

Since H.R. 12549 contained a short policy statement, the original policy statements of S. 1075 in Title I were incorporated into the House amended version.

Section 101 of S. 1075 in both the original form and the House-amended form contained the national environmental policy. Section 101(a) of S. 1075 had essentially the same language as Section 101(a) of NEPA. The two sections can be compared in Appendix B and Appendix A respectively. The difference in language has no interpretive significance.

Section 101(b) of NEPA was originally a part of Section 101(a) of S. 1075, but was separated into the second subparagraph in the conference of the Senate and House. As a result, the general policy statement is contained in Section 101(a) and a statement of goals in Section 101(b). Again these changes have little or no significance.

Changes to Section 101(c) in the conference were significant. The Conference committee amended the language which read "each person has a fundamental and inalienable right to a healthful environment" (36, p. 207). In NEPA, Section 101(c) reads "each person should enjoy a healthful environment" (1, p. 422). This change was made by the Conference committee.

Senator Jackson opposed this change. His views were expressed as he presented the Conference report to the Senate and stated:

I opposed this change in Conference committee because it is my belief that the language of the Senate passed bill reaffirmed what is already the law of the land; namely, that every person does have a fundamental and an inalienable right to a healthy environment (39, p. 40416).

According to Finn (20, p. 427), this legal right was based on the premise that an individual's physical well-being, upon which his other rights are dependent, is itself based upon a healthy environment. However, the language was changed "because of doubt on the part of the House conferees with respect to the legal scope of the original Senate version" (40, p. 3). It is apparent from the language and the doubts expressed that Congress intended something less than an absolute legal right to a healthful environment.

In regard to the policy of Section 101, Senator Jackson stated:

A statement of environmental policy is more than a statement of what we believe as a people and as a nation. It establishes priorities and gives expression to our national goals and aspirations. It provides a statutory foundation to which administrators may refer to it for guidance in making decisions which find environmental values in conflict with other values (39, p. 40416).

This statement as well as others presented in this chapter indicate the Section 101 environmental policy statement was intended to be actively applied to decision-

making within the Federal Government.

Although Section 102 contains the main thrust of the "action-forcing" provisions, as will be shown in the next chapter, Section 102 must be construed and applied in the context of Section 101 policies. However, in Section 101, Congress stopped short of creating a "fundamental and inalienable right" to a healthful environment. So, the degree of action taken on Section 101 lies between an active policy based upon the creation of an absolute legal right and the somewhat passive role of a policy which merely operates as a statement of principle. The language of Section 101 helps define this role.

The first paragraph of Section 101 in NEPA (1, p. 421) declares that the continuing policy of the Federal Government is to use all practicable means and measures for creating and maintaining conditions under which man and nature can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations of Americans. It was recognized in this Act that human activities exert profound impacts on the interrelations of all components of the natural environment. These impacts are in part covered by population growth, high density urbanization, industrial expansion, resource exploitation, and accelerated rates of technological innovations.

The second paragraph states the Federal Government is to use all practicable means and measures, consistent with

other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources. These means and measures are to be undertaken so the nation may attain the following goals:

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
- (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
- (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources (1, p. 422).

The final paragraph recognizes that each person should enjoy a healthful environment and in addition has a responsibility to contribute to the preservation and enhancement of the environment.

The words "use all practicable means and measures" are basically words of action and apply to both the first and second paragraphs. They provide a mandate for the Federal Government to create harmony between man and nature, yet fulfill man's social, economic and other needs. They also direct that Federal actions should be formulated to enable national attainment of the six goals enumerated in Section

101(b). These mandates are consistent with the words of Caldwell, Senator Jackson and others who suggested an active policy provision in NEPA.

Even though Section 101 does not create a fundamental and inalienable right to a healthful environment for individual persons, it has been viewed as intended to bring about substantive changes in Federal agency decision-making. Often Section 101 is referred to as the substantive portion of the NEPA and Section 102 the procedural part of the Act. Black (27, p. 1367) describes procedural law as that which prescribes methods of enforcing rights while substantive law, according to Black (27, p. 1598) creates, defines, and regulates rights, rather than prescribing methods of enforcing them. It would follow that Section 101 would create the right to force the agency to follow the policies in Section 101 and the methods of enforcing this right would be established in Section 102. In the context shown above, the EIS process would generally be considered procedural and the policy provisions of Section 101 would affect substantive changes in governmental decisions.

There is considerable legal support for the notion that Section 101 creates substantive duties for Federal agencies. The first landmark NEPA court case discussing this issue was Calvert Cliff's Coordinating Committee versus Atomic Energy Commission (22). In this case, the Court stated:



Section 101 sets forth the Act's basic substantive policy: that the Federal government 'use all practicable means and measures' to protect environmental values. Congress did not establish environmental protection as an exclusive goal; rather it desired a reordering of priorities, so that environmental cost and benefits will assume their proper place along with other considerations (22, p. 1112).

In the Gillham Case, another landmark decision which involved one of the projects located in the Tulsa District, Corps of Engineers, the Court stated:

The language of NEPA, as well as its legislative history, make it clear that the Act is more than an environmental full disclosure law. NEPA was intended to affect substantive changes in decision making. Section 101(b) states that agencies have an obligation 'to use all practical means, consistent with other essential considerations of national policy.... to preserve and enhance the environment' (41, p. 297).

The substantive aspect of Section 101 was also discussed in a very recent decision, Sierra Club versus Morton.

Here the court stated:

Section 102(2) contains the procedural requirements designed to compel all federal agencies contemplating actions having a significant impact on the environment to consider NEPA's substantive policies and goals as enunciated in Section 101 (42, p. 1770).

The Court was describing the relationship between the procedural requirements of Section 102 and the substantive provisions of Section 101.

Although the courts have generally considered Section 101 as substantive and Section 102 as procedural, there are some subsections of Section 102 which are also substantive in nature. These will be discussed in Chapter IV.

The Judiciary has interpreted and applied the policy provisions of Section 101, yet the policies have not been substantially expanded in agency guidelines and regulations. The guidelines promulgated by CEQ discuss in detail the procedures for the EIS, but do not contain any significant provisions interpreting or expanding Section 101.

However, the Corps regulation implementing NEPA contains the following statement:

NEPA mandates a view of traditional policies and missions in light of NEPA's national environmental policy which requires all Federal agencies and officials to use all practical means and measures to enhance, preserve and protect the quality of the environment to the fullest extent possible (43, p. 2).

Obviously, a large part of this language came from NEPA so the regulation in effect is reiterating the NEPA policy.

#### Conclusions

The main thrust of NEPA environmental policy is contained in Section 101. This policy emanated from Senator Jackson's Interior Committee and stayed essentially intact throughout the legislative process. Statements by persons who formulated the policy such as Caldwell, Carpenter and Senator Jackson indicate they expected the policy to play an active role in government decision-making. Their viewpoint was carried forward by the courts which regard the policy as a substantive law, that is a law which creates a duty for Federal agencies to consider environmental amenities. However, difficulties in applying this law are encountered

because the policy statement is very general and does not set any criteria or standards to guide the agencies. Perhaps this is good in that it allows the agency flexibility in achieving the goals outlined in Section 101(b).

The importance of the policy provisions to the water resource engineer who is required to comply with NEPA is apparent, for he must go beyond a mechanical development of EIS's and recommend decisions which tend to achieve the goals enumerated in Section 101. This requirement will serve as a basis for evaluating the NEPA compliance of Tulsa District shown in Chapter VI.

## CHAPTER IV

### SECTION 102 - THE ACTION

#### FORCING PROVISIONS

Section 102 of NEPA is probably the most controversial provision of the Act. The purpose here is to construe and define this section in light of its legislative history, court decisions and agency guidelines and regulations. The analysis in this chapter will be used as a basis for the EIS evaluation criteria developed in Chapter V.

#### Legislative History

One of the earliest expressions of concern for mechanism to implement the national environmental policy was made by Russell Train as he testified to the Senate Committee on Interior and Insular Affairs in regard to S. 2282, a forerunner to S. 1075. At the 1968 hearings on S. 2282, Train, who was later to become Chairman of CEQ stated:

We badly need a method for assuring that ecological principles and criteria receive appropriate weight in all Federal decision making (44, p. 59).

At the time of this statement, consideration was being given to creating a board or council in the Executive Office of the President to enforce the proposed environmental law.

This idea was expanded by Caldwell in his report entitled "A National Policy for the Environment" (32). In this report, Caldwell stated:

These two major needs, (a) a high-level reviewing and reporting agency and (b) an information gathering and organizing system, are the essential structural innovations proposed in bills now before the Congress for implementing a national environmental policy (32, p. 112).

The need for information gathering evolved into the EIS process established by Section 102. This process was also referred to by Caldwell when he discussed the implementation of a national environmental policy by saying, "I would urge that in the shaping of such policy it have an action-forcing, operational aspect" (32, p. 116). In regard to this operational aspect, Caldwell stated further:

....a statement of policy by the Congress should at least consider measures to require the Federal agencies, in submitting proposals, to contain within the proposal an evaluation of the effect of these proposals upon the state of the environment....(32, p. 116).

It should be noted here that he stated the evaluation was to be contained within the proposal. At the first of Section 102(2)C, the Act states that the detailed statement should be included in every recommendation or report, but later in that same section it states that the detailed statement shall accompany the proposal through the existing agency review process. As will be shown later, this ambiguity in the language of the Act has been resolved in favor of the statement accompanying the proposal or report rather than being incorporated into the proposal or report. This

is discussed at some length here to show that the separation of the environmental statement from the basic proposal goes beyond the expressed intent of Professor Caldwell which formed the initial impetus of the action-forcing provisions of the Act.

In response to Caldwell's testimony and inputs, Section 102 was included in the amendment to S. 1075 discussed in Chapter III. Section 102 of the amendment required that Federal agencies should do the following:

(1) utilize to the fullest extent possible a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision-making which may have an impact on man's environment;

(2) identify and develop methods and procedures which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations;

(3) include in every recommendation or report on proposals for legislation or other significant Federal actions affecting the quality of the human environment a finding by the responsible official that:

(i) the environmental impact of the proposed action has been studied and considered;

(ii) any adverse environmental effects which cannot be avoided by following reasonable alternatives are justified by stated considerations of national policy;

(iii) local short-term uses of man's environment are consistent with maintaining and enhancing long-term productivity; and

(iv) any irreversible and irretrievable commitments of resources are warranted (36, p. 207).

While the above language is very similar to that in NEPA, there are some differences. These will be discussed in detail in the subsection by subsection analysis presented

later in this chapter.

A few minor changes were made by the Interior Committee to the amended S. 1075 before it was reported to the Senate. These changes were not significant. The Senate unanimously approved the bill and referred it to the House of Representatives.

Meanwhile concern developed in the Senate Public Works Committee headed by Senator Muskie (20, p. 462). This Committee and its staff viewed S. 1075 with its broad general provisions as an infringement upon their jurisdiction over air and water pollution legislation. This legislation contained standards and criteria to define pollution; however, S. 1075 contained no such standards or criteria. The broadness of the policy in S. 1075 threatened to conflict with the proposed pollution standards and could possibly override them.

Also, a basic philosophical difference existed between Senator Muskie and Senator Jackson. Senator Jackson thought pollution abatement could be achieved by making Federal agencies internally responsive while Senator Muskie believed self-policing by Federal agencies would not be effective.

As will be shown, these two differences manifested themselves in regard to Section 102. Senator Jackson viewed the action-forcing provisions as a practical way to implement the national environmental policy, yet Senator Muskie viewed Section 102 as a loophole for Federal

agencies. In his view, Federal agencies could justify adverse environmental impacts in their "findings" by emphasizing other national goals.

After the House of Representatives passed their version of NEPA and incorporated it into the Senate version, the combined proposal was sent to a Senate-House Conference to resolve the differences in the respective versions of the law. However, prior to the conference, additional changes had been made to the Senate proposal because of the conflicts between Senator Jackson and Senator Muskie. These conflicts were resolved in the Jackson-Muskie compromise, and the Senate passed the compromise version which was sent to conference for final resolution between the Senate compromise version and the House version. In the following paragraphs, the changes to the law as it passed through the compromise in the Senate and the Senate-House conference are discussed in the following subsection by subsection analysis. In addition, Congressional testimony, court decisions, guidelines and regulations are discussed which apply to the subsection being analyzed.

### Section 102 Analysis

Section 102 of NEPA begins with the following statement:

The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set



forth in this Act,... (1, p. 427).

The Senate-House Conference Committee explained the above language as follows:

To remedy present shortcomings in the legislative foundation of existing programs, and to establish action-forcing procedures which will help to insure that the policies enunciated in Section 101 are implemented, Section 102 authorizes and directs that the existing body of Federal law, regulation, and policy be interpreted and administered to the 'fullest extent possible' in accordance with the policies set forth in this act (39, p. 40419).

This interpretation again shows that the purpose of Section 102 is to implement the policies of Section 101. Also, added emphasis was given to all of Section 102 by adding the words "to the fullest extent possible." This change was made in the Senate-House Conference as originally this phrase applied only to Section 102(a). After the change, it applied to all of Section 102. Therefore, a Congressional emphasis was placed on all of Section 102.

The importance of this first part of Section 102 may not be apparent when looking only to the language of this subsection. It has been combined by the courts with the language of Section 101 and Section 102(2)B to create a mandate for Federal agencies to consider environmental amenities in Federal decision-making. In effect, this section augments the strength of all of Section 102 with the language "to the fullest extent possible" (1, p. 427) and provides a link between Section 102 and the policy provisions of Section 101.

The next subsection is 102(2)A which states the following:

(2) all agencies of the Federal Government shall--(a) utilize a systematic, interdisciplinary approach which will insure the intergrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment (1, p. 428).

The explanation of this subsection by the Senate-House Conference report is as follows:

Wherever planning is done or decisions are made which may have an impact on the quality of man's environment, the responsible agency or agencies are directed to utilize a systematic, interdisciplinary, team approach. Such planning and decisions should draw upon the broadest possible range of social and natural scientific knowledge and design arts. Many of the environmental controversies of recent years have, in large measures, been caused by the failure to consider all relevant points of view and all relevant values in the planning and conduct of Federal activities. Using an interdisciplinary approach that brings together the skills of landscape architect, the engineer, the ecologist, the economist, the sociologist, and other relevant disciplines would result in better planning, better projects and a better environment. Too often in the past, planning has been the exclusive province of the engineer and cost analyst. And, as a consequence, too often the humanistic point of view, the relationship between man and his surroundings has been overlooked or purposefully ignored (39, p. 40419).

This report listed disciplines which are to be used in the interdisciplinary approach. These included but were not limited to landscape architecture, engineering, ecology, economics and sociology. The staffing by the Corps in response to this subsection will be displayed and discussed in Chapter VI.

The CEQ Guidelines (45) expand Subsection 102(2)A by stating the following:

The interdisciplinary approach should not be limited to the preparation of the environmental impact statement, but should also be used in the early planning stages of the proposed action (45, p. B-5).

The Corps regulation, ER 1105-2-507 (43) makes the following statement concerning implementation of Subsection 102(2)A:

Interdisciplinary environmental investigations leading to the preparation of environmental statements should be undertaken simultaneously with and to the same depth and scope as study or project related engineering, economic and technical studies (43, p. 10).

In addition to the language above, the Corps regulation states:

During Corps of Engineers project planning and the related decision making process, a systematic and interdisciplinary approach will be utilized.... (43, p. 2).

The Corps regulation continues with a discussion of balancing environmental effects with engineering, economic, social and other considerations, which are addressed in Subsection 102(2)B.

Subsection 102(2)B of NEPA contains the following:

Identify and develop methods and procedures in consultation with the Council on Environmental Quality established by Title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical consideration (1, p. 428).

S. 1075 (38) in its amended form required more than the mere

consultation with CEQ shown above. The evolution of this is discussed in the following paragraph.

As previously stated, Senator Muskie did not believe in the concept of self-policing by Federal agencies. During the presentation of the Jackson-Muskie compromise in the Senate, Senator Muskie stated:

The concept of self-policing by Federal agencies which pollute or license pollution is contrary to the philosophy and intent of existing environmental quality legislation; ...these agencies have always emphasized their primary responsibility making environmental considerations secondary in their view (38, p. 29053).

This viewpoint prevailed insofar as Subsection 102(B) of S. 1075 was concerned for the Senate made the methods and procedures enumerated in this section subject to the "review and approval of the Board of Environmental Quality Advisors" (38, p. 29051). This was obviously very strong language and would have given the Board of Environmental Quality Advisors powers to approve or disapprove methods and procedures used to evaluate environmental amenities. However, the language was diluted during the events that followed. This is indicated in the Congressional Record where the following is found:

This section was modified by the adoption of language requiring all agencies to consult with the Council. In part, this was a language change which was discussed and agreed to on October 8, on the Senate floor (38, p. 40417).

Therefore the House-Senate Conference reduced the power of CEQ from the power to review and approve to a

consultation function. This action was taken after the Jackson-Muskie compromise in the Senate and apparently the new language was inserted into the law with full consideration given to statements made for the compromise on October 8, 1969. In addition, the Conference committee submitted the following analysis of Subsection 102(2)B:

All agencies which undertake activities relating to environmental values, amenities, and aesthetic considerations, are authorized and directed, after consultation with the Council and other environmental control agencies, to make efforts to develop methods and procedures to incorporate those values in official planning and decision making (38, p. 40420).

The Congressional history of Subsection 102(2)B indicates an intent to reduce the role of CEQ from a decision-making role to merely an advisory role, insofar as methods and procedures used to incorporate environmental amenities into the decision-making process are concerned. CEQ does have the function of advising the President, as is shown in NEPA, Title II (Appendix A), and the President can make decisions based upon this advice. This will not be analyzed here as an analysis of the Federal structure at the Washington level is beyond the scope of this study.

Perhaps the most important part of Subsection 102(2)B is the following language:

...identify and develop methods and procedures....which will insure that presently unquantifiable environmental amenities and values may be given appropriate consideration in decision making along with economic and technical consideration (1, p. 428).

The importance of this provision has been stated in court decisions such as the Calvert Cliff's case where the court stated:

Perhaps the greatest importance of NEPA is to require the Atomic Energy Commission and other agencies to consider environmental issues just as they consider other matters within their mandates. This compulsion is most plainly stated in Section 102 (22, p. 1112).

Following the statement, the court quoted Subsection 102(1) and Subsection 102(2). After the quote, the court stated:

Only once - in Section 102(2)B - does the Act state in terms, that federal agencies must give full 'consideration' to environmental impact as part of their decision making processes. However, a requirement of consideration is clearly implicit in the substantive mandate of Section 101, in the requirement of Section 102(1) that all laws and regulations be 'interpreted and administered' in accord with that mandate, and in other specific procedural measures compelled by Section 102(2).....Thus a purely mechanical compliance with the particular measures required in Section 102(2)C and D will not satisfy the Act if they do not amount to full good faith consideration of the environment (22, p. 1112).

A cursory examination of the law would indicate the court went beyond the language of NEPA. For Subsection 102(2)B states that environmental amenities may be given appropriate consideration. The word "may" creates more of a discretionary order rather than one that would be mandatory. However, the court went beyond this language by considering it in light of Section 101 and Subsection 102(1). In addition, the court quoted Senator Jackson in the Congressional Record as stating the Act "directs all

agencies to assure consideration of the environmental impact of their actions in decision-making" (38, p. 40416). By considering the overall language and circumstances of passage of the law, the courts have construed it as stating that Federal agencies must give full consideration to environmental impacts as part of their decision processes.

The main thrust of the interpretation could have been diminished by consideration of the word "appropriate," for "appropriate" consideration might be construed to be less than "full" consideration. However, in this regard, the court stated:

The word 'appropriate' in Section 102(2)B cannot be interpreted to blunt the thrust of the whole Act or to give agencies broad discretion to down-play environmental factors in their decision making processes. The Act requires consideration 'appropriate' to the problem of protecting our threatened environment, not consideration 'appropriate' to the whims, habits, or other particular concerns of federal agencies (22, p. 1113).

Therefore the court rejected emphasis on the word "appropriate."

As stated by Anderson (21, p. 250), the concept of "consideration" is difficult to define. An agency could consider environmental amenities and then proceed to make decisions which extensively degrade the environment. However, in the Calvert Cliff's case (22), the court partially defined the word "consideration" by requiring the agencies to balance or determine tradeoffs for environmental con-

cerns and for economic and technical factors. In this regard the court stated:

'Environmental amenities' will often be in conflict with 'economic and technical consideration.' To 'consider' the former 'along with' the latter must involve a balancing process. ...NEPA mandates a rather finely tuned and 'systematic' balancing analysis in each instance (22, p. 1113).

The balancing or consideration of environmental trade-offs was not without legal basis. For Senator Jackson made the following statement as he presented the amendments to S. 1075. In regard to the paragraph which ultimately became Subsection 102(2)B he stated:

Subsection 102(B) (Section 102(2)B in NEPA) requires the development of procedures designed to insure that all relevant environmental values and amenities are considered in the calculus of project development and decision making (38, p. 29055).

The court interpreted this statement as a recognition of the requirement of a balancing judgment. The above language as well as that of the Act make this a reasonable interpretation.

The Corps regulation carries the concept through to its actions with the following directive:

During Corps of Engineers project planning and the related decision making process, a systematic and interdisciplinary approach will be utilized to insure proper weighing and balancing of environmental effects together with the engineering, economic and social and other considerations affecting the total public interest (43, p. 2).

The concept of "balancing" is easy to understand, but is difficult to implement. The language of Senator Jackson



as well as that of the courts and regulations imply there is a precise technique to reduce all values to a set of numbers and merely follow the decision which provides the best number. The problem is two-fold. First, the numbers are sometimes based on forecasts; and secondly, environmental amenities are generally not quantifiable. Even if environmental considerations are quantified, the units are not the same as those for the numbers generated in the economic and technical areas. For a comparative analysis, subjective decisions are made to cover the broad scope of considerations which must be analyzed to comply with the Act. Both the forecast and the quantification problems result in uncertainty.

The discussion of the balancing concept led to a consideration of costs and benefits. In the Calvert Cliff's case, the court stated:

NEPA mandates a case-by-case balancing judgment on the part of federal agencies. In each individual case, the particular economic and technical benefits of planned action must be accessed and then weighed against the environmental costs; alternatives must be considered which would effect the balance of values (22, p. 1123).

This language by the court in Calvert Cliff's case led to a diversity of opinion between Anderson (21, p. 254) and Kessler and Berlin (23, p. 213). Anderson concluded the court did not necessarily require a traditional benefit-cost analysis in the EIS, but should show only environmental risk and benefits. As stated in Chapter II, Kessler and Berlin disagreed and indicated Anderson's

interpretation was too restrictive. The disagreement is somewhat outdated now, for in later cases such as The Environmental Defense Fund versus Tennessee Valley Authority (46), the court held that it is proper to include economic information in the EIS; however, the court stopped short of judicially reviewing the analysis used to develop the benefit-to-cost ratio (BCR). In this regard the court cited a long list of other decisions and stated the following:

Calculation of the B/C (Benefit/Cost) ratio required under the Flood Control Act of 1936 and Senate Document No. 97 has almost uniformly been deprived judicial review (46, p. 1015).

Their reasoning for this rule is two-fold. First, review of the BCR has traditionally been in the province of the Congress and secondly, courts are constrained by the general rule that they are not allowed to substitute their judgment for that of the agency.

The heart of the action-forcing mechanism is contained in Subsection 102(2)C. Since this subsection proliferated numerous guidelines and regulations, that portion of this analysis is included in Chapter V where the criteria for evaluation of EIS's is developed. The discussion at this point will be limited to legislative history and court interpretation. Subsection 102(2)C states that Federal agencies should do the following:

...include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed

statement... (1, p. 428).

Most of Subsection 102(2)C originated from Senator Jackson's amendment to S. 1075 (Appendix B). However, several changes occurred before final passage into law. One of the first changes was suggested by the Bureau of the Budget (BOB), now referred to as the Office of Management and Budget. Prior to the BOB request Subsection 102 (2)C applied to significant Federal actions affecting the quality of the human environment. After the change, the scope was narrowed to major Federal actions significantly affecting the quality of the human environment. According to Finn (20, p. 439), the change was made by the BOB to prevent agencies from requesting additional funds to hire ecologists to comply with Section 102. As will be shown in Chapter VI, the results desired by BOB appear doubtful.

A second change occurred during the Jackson-Muskie compromise. The word "finding" in the amendment to S. 1075 was changed to "detailed statement." According to Finn (20, p. 505), the Public Works Committee viewed the word "finding" as being too inflexible. In their view, the word "finding" is a precise legal term which in effect means the agencies preparing statements could decide what the facts were, and once the facts are established they could only be reviewed in a court of law. The changing of this word gave more consistency to the law because at the end of Subsection 102(2)C was added a paragraph providing for review of the "statement" by other agencies. The use

of the word "finding" with its more restrictive review possibilities would have created an ambiguity in the law.

Also, the use of the phrase "detailed statement" removed the possibility of providing a summary statement to satisfy EIS requirements. According to Anderson (21, p. 200) courts have generally held that in order to comply with Subsection 102(2)C, a statement must discuss the five points listed in Subsection 102(2)C in a detailed manner. However, a better defined standard is shown in the Gillham Case as follows:

At the very least NEPA is an environmental full disclosure law...The 'detailed statement' required by Section 102(2)C should, at a minimum contain such information as will alert the President, the Council on Environmental Quality, the public and, indeed, the Congress, to all known possible environmental consequences of the proposed agency action (47, p. 759).

A number of courts have adopted the above stated rule and in general three standards of adequacy have been developed. These are that statements should be understandable and nonconclusory, that statements should refer to the full range of knowledge, and that statements must discuss certain impacts which are typical of certain types of action.

The opening statement of Subsection 102(2)C in NEPA is followed by a listing of five required points to be contained in the EIS. The amendment to S. 1075 originally contained four. During the Jackson-Muskie compromise, the requirement for a display of alternatives to the proposed

action was added. The scope of alternatives was broadened because it was originally attached to the provision in Subsection 102(2)C which pertained to adverse environmental effects.

The requirement for a discussion of alternatives to the proposed action is worthy of special mention. Emphasis is given the alternative discussion by Subsection 102(2)D of NEPA which states:

...study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources (1, p. 428).

In addition, the discussion of alternatives in the EIS is the most frequent subject of litigation. This is not surprising since the two provisions are telling the agencies to present options which may not be favored by the agency. Also, the range of alternatives cannot be precisely defined.

The courts have prescribed a range of alternatives to include "no action" at one extreme and a "full action" which achieves the goal sought by the Federal action at the other extreme. This apparently is consistent with Congressional intent which interpreted Subsection 102(2)(C) iii of NEPA to require "alternative ways of accomplishing the objectives of the proposed action and the results of not accomplishing the proposed action" (39, p. 40420).

According to Anderson (21), the alternatives discussion should be of sufficient depth to permit a reviewer to

make a reasoned choice. In addition, he found that the scope of alternatives must go beyond the power of the agency to implement. The Corps regulations addressing these matters are presented in Chapter V.

The Jackson-Muskie compromise resulted in one final, but important change to Section 102. The following language was added to Section 102 after the five required points to be included in the EIS.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes (1, p. 428).

Senator Muskie had argued for a separate agency with authority to approve or disapprove the EIS. Senator Jackson disagreed. The compromise they reached resulted in the language as shown above and required the Federal agency to obtain the views of any agency which has jurisdiction by law or special expertise with respect to any environmental impact involved.

The Senate-House Conference Committee suggested the President prepare a list of agencies that have jurisdiction by law and special expertise over the various environmental matters. This was accomplished and a detailed list of the

agencies appear as Appendix I to the CEQ Guidelines (45).

The discussion of Subsection 102(2)D was included in the discussion of alternatives under Subsection 102(2)(C) iii. The Congressional history of Subsection 102(2)D did not add this previous discussion.

Subsections 102(2)E, 102(2)F and 102(2)H did not have any significant Congressional history. Since their content is worded in a forthright manner, a discussion of interpretation is not needed.

Subsection 102(2)G of NEPA requires Federal agencies to initiate and utilize ecological information in the planning and development of resource-oriented projects. The Senate-House Conference Committee interpreted this subsection as follows:

Each agency which studies, proposes, constructs, or operates projects having resource management implications is authorized and directed to consider the effects upon ecological systems in connection with their activities and to study such effects as a part of its data collection (39, p. 40420).

It follows that a consideration of the natural environment must include a study of the ecological systems that are involved.

#### Summary

Concern for an "action-forcing" mechanism to implement the national environmental policy began early in the legislative history of NEPA. A high level reviewing agency and an information gathering mechanism were perceived as the

means to implement the policy.

Senator Jackson's amendment to S. 1075 contained the basic concept which eventually evolved into Section 102 of NEPA. The Bureau of Budget, Senator Muskie and his Public Works Committee and the Senate-House Conference Committee brought about some significant changes to the amended S. 1075. In addition, court decisions, CEQ Guidelines and Corps regulations have helped define and expand Section 102 into a workable law. The changes and interpretations are discussed in the following paragraphs.

The Congressional Record as well as court decisions explicitly state that the purpose of Section 102 is to insure implementation of the policies enunciated in Section 101. This basic purpose underlies the meaning and interpretation of the specific subsections discussed in the following paragraphs.

Subsection 102(1) states that "to the fullest extent possible" all laws shall be interpreted in accordance with NEPA policies. The courts have used this subsection to link other subsections in Section 102 to the policy provisions of Section 101. This in effect applies the words "to the fullest extent possible" to a broad portion of NEPA. The Congressional intent is illustrated by the fact that the wording was added in the Senate-House Conference which places a Congressional emphasis on the use of the words.

Subsection 102(2)A requires a systematic interdisci-



plinary approach be used in Governmental decision-making. The Congressional Record explicitly required that the scope of the disciplines involved in environmental studies go beyond the engineer and cost analyst. The CEQ guidelines expand the use of a systematic, interdisciplinary approach to apply not only to preparation of the EIS, but also to the earliest stages of planning. The Corps regulations go beyond CEQ concept by requiring that environmental studies used in planning should have the same depth and scope as related engineering and economic studies.

Senator Muskie attempted to strengthen the function of CEQ by providing the power to approve or disapprove methods and procedures used in environmental analyses. This was curtailed in the Senate-House Conference where these powers were replaced by an advisory role for CEQ.

One of the most important subsections in Section 102 is Subsection 102(2)B which requires that agencies give "appropriate consideration" to environmental concerns. The language is somewhat discretionary because the law states appropriate consideration "may be" given. However, the courts have strengthened the language of this subsection through an interpretative linkage of Subsection 102(1) and Section 101. The result is that agencies must give full consideration of environmental impacts in their decisions. The courts have also interpreted "consideration" to mean that a balancing of environmental amenities with economic and technical considerations must be accom-

plished and where environmental concerns conflict with economic and technical requirements, trade-offs should be identified. The extent to which the Corps has accomplished this and the results obtained will be discussed further in Chapter VI.

Costs and benefits for both economic and environmental aspects have caused some confusion in the courts, and according to the law, the economic analysis should be summarized in the EIS. The courts, in limiting the scope of their judicial review, have refused to review the analysis or basis of the benefit-cost ratio. The rationale for this rule is that traditionally economic costs and benefits are reviewed by Congress and the courts do not want to invade the province of Congress. Also, the courts do not want to substitute their judgment for that of the agency.

Subsection 102(2)C establishes the basic requirements for the EIS. The Bureau of the Budget restricted the application of the Subsection 102(2)C to "major" Federal actions; however, the restrictive interpretation of this provision hoped for by BOB has not materialized as will be shown in Chapter VI.

The EIS was originally called a "finding" in Senator Jackson's amended S. 1075. The change to "detailed statement" has significantly changed the role of the EIS and has made it available for public scrutiny and review. Language added at the end of Subsection 102(2)C requiring coordina-

tion with other agencies has partially been responsible for this role of the EIS. This language resulted from a compromise between Senator Jackson and Senator Muskie.

The courts have defined the EIS requirements to provide a document which provides sufficient information for decision makers, yet be in simple enough terms for public understanding. In addition, EIS's should be non-conclusory, should refer to a full range of knowledge, and discuss impacts typical of the proposed action.

Five elements are required of the EIS. These elements will be discussed in detail in the next chapter. The element litigated most frequently requires a presentation of alternatives of the proposed action.

The alternatives discussed in the EIS should range from the "no action" alternative to an alternative that fully achieves the goals of the proposed action. Agency authority or powers should not limit the scope of the alternatives studied.

The last portion of Subsection 102(2)C requires coordination of the EIS with other Federal agencies with "jurisdiction by law" or "special expertise" over the subject of the proposed action. A detailed listing of agencies has been developed by CEQ.

The last subsections are insignificant insofar as interpretation is concerned. However, Subsection 102(2)G requires agencies to initiate and utilize ecological information in the planning of resource-oriented projects.

The results of this chapter will be used as a basis for developing EIS evaluation criteria in Chapter V. In addition, the interpretation of Subsection 102(2)B will be used as a standard to evaluate compliance with the substantive portion of law by the Corps of Engineers.

## CHAPTER V

### EIS EVALUATION

The purpose of this chapter is to develop and apply EIS evaluation criteria and to present the results of applying this criteria to a sample of Environmental Impact Statements. Basically, the criteria was developed to test EIS procedural compliance. The language of Subsection 102 (2)C is expanded through use of CEQ Guidelines and Corps Regulations. This expanded meaning of interpretation is then used to evaluate a sample of Environmental Impact Statements. A discussion of the EIS sample and results of the evaluation are also presented on a section by section basis.

Unless otherwise shown, the word "statement" in this chapter will be used interchangeably with EIS or Environmental Impact Statement.

#### EIS Sample

The criteria developed in this chapter were used to evaluate a sample of seventeen Corps of Engineers water resource projects which were reviewed by the Board of Engineers for Rivers and Harbors during the last half of 1974 and the first half of 1975. This sample represents

the latest generation of EIS's and contains EIS's developed by seventeen different Corps Districts out of the total thirty-six Districts in the Corps. The projects are categorized by project purpose in Table I.

TABLE I  
DISTRIBUTION OF PROJECT PURPOSES  
IN EIS SAMPLE

Project Purpose or Purposes	Number of Projects
Beach Erosion Control only	1
Beach Erosion Control and Hurricane Protection	2
Chloride Control	1
Flood Control only	5
Flood Control and Recreation	1
Flood Control, Recreation and Irrigation	1
Flood Control, Recreation and Navigation	1
Hydro-power	1
Navigation	<u>4</u>
TOTAL	17

Both the CEQ Guidelines (45) and the Corps Regulation, ER 1105-2-507 (43) contain specific instructions as to the content of the EIS. The EIS is divided into nine sections.

Each section covers a topic which is required by the Corps Regulations and the CEQ Guidelines. Five of the sections cover topics specifically required by Subsection 102(2)C of NEPA. These topics are the same as the five points discussed in the previous chapter. The nine sections required by the Corps Regulations are the major headings which follow in this chapter.

### Project Description

The project description is not explicitly required by NEPA; however, it is obvious that a reviewing agency, the courts or the public should have a knowledge of the proposed action in order to properly evaluate its environmental consequences. The CEQ Guidelines (45) therefore require a project description as follows:

A description of the proposed action, a statement of its purposes, and a description of the environment affected, including information, summary technical data, and maps and diagrams where relevant, adequate to permit an assessment of potential environmental impact by commenting agencies and the public. Highly technical and specialized analyses and data should be avoided in the body of the draft impact statement. Such materials should be attached as appendices or footnoted with adequate bibliographic references (45, p. 20553).

The CEQ Guidelines continue in the same paragraph with requirements for the environmental setting without the project. However, the Corps Regulation has the environmental setting without the project as a separate section. In this chapter the environmental setting without the project will

be presented as a separate topic.

For a project description the Corps Regulation (43) requires the following:

Describe the proposed action by name, specific location, project dimensions and purposes, authorizing document, current status, and the benefit-cost ratio. Generally delineate the purpose of the project, what the plan of improvement entails, and how the plan would operate. It is most important that a clear work picture be presented. For reservoirs give pool storage and surface areas for all projects purposes, miles of shoreline, miles of streams inundated, total acres of the project facilities, e.g., dam, spillway, recreation area, public use areas, public access sites, mitigation lands and measures, etc. and how the project would be operated. For other proposed actions, a complete description of all structures, project dimensions and purposes, and activities included within the project should be discussed. The inter-relationship and compatibility of the project with existing or proposed Corps or other agency projects must be discussed (43, p. C-3).

In addition, the regulation requires that sufficient summary economic information be shown to indicate the extent to which non-quantifiable environmental benefits and costs have not been reflected in the benefit to cost determination. Also a discussion of fish and wildlife mitigation benefits and costs plus the rationale for selection of the mitigation plan are required. Based on these requirements, plus those quoted above in the project description paragraph, the sample of Environmental Impact Statements was evaluated and the results are presented in Table II. These evaluations were based on the criteria that the description should be adequate to permit a careful assessment of environmental impact by commenting agencies, the courts



and the public.

TABLE II  
EIS REQUIREMENTS FOR PROJECT  
DESCRIPTION

Project Description Item	Percent of Statements with Satisfactory Project Description
Project Dimensions	100
Authorizing Document	88
Project Status	88
Benefit to Cost Ratio	64
Purpose	100
Compatibility with other projects	58
Fish and Wildlife Mitigation Plans	35
Economic Summary	70

In general, the presentation of project dimensions was excellent. This would be expected since the Corps is an engineering organization and dimensioning is emphasized in engineering.

Reference to the authorizing document was omitted in several instances; however, this is not a significant deficiency since a document called the survey report

usually contains a full display of the authorizing law. The survey report is the basic decision-making document which is sent to Congress usually recommending the proposed Federal action. However, omitting the reference to the authorizing document from the EIS would be bothersome to a reviewing agency or court due to the inconvenience of referring to other documents for this information.

The definition of "project status" is somewhat uncertain; however, some statements set aside a separate paragraph and gave the status of the project in the Corps planning process and gave the status of local cooperation. Other statements omitted this as a separate item, but included some discussion of status with other items. Eighty-eight percent complied with this part of the regulation.

About sixty-four percent of the sample included the benefit-to-cost ratio (BCR) in the project description section of the statement. This is somewhat surprising since as stated in Chapter IV the court decisions indicate this item should be included. About seventy percent of the statements included an economic summary which relates closely to the presentation of the BCR. The extent of the summary varied from a statement of costs and benefits to several pages of economic tabulations. The statements considered adequate were considered satisfactory on the basis that enough information was provided to show economic justification in the traditional manner.

The project purpose was included in all of the state-

ments, therefore no further discussion is warranted.

Compatibility with other projects was discussed under the project description in about fifty-eight percent of the statements reviewed. This may appear alarming in view of the concerns expressed in NEPA for a comprehensive approach to environmental impact assessment and for avoiding unintended consequences resulting from Federal actions. However, most of the projects where a discussion of compatibility with other projects was omitted had very localized impacts and the probability of significant interactions environmentally or otherwise with other projects are remote. In addition, discussion of this aspect was found in other parts of the EIS in some instances.

The discussion of fish and wildlife mitigation features was found in only thirty-five percent of the statements. Fish and wildlife mitigation features are not necessarily included in all projects. In the sample, no projects were highly controversial from an environmental standpoint and most of them were not affecting the natural environment to the extent that some of the more controversial projects have. This provides some rationalization for the lower percentage on this item; however, this is one area where some added discussion could improve the quality of the Environmental Impact Statements.

#### Environmental Setting Without the Project

The environmental setting without the project is also

not required in Subsection 102(2)C of NEPA. However, it is alluded to in the CEQ Guidelines where the following is stated:

The statement should also succinctly describe the environment of the area affected as it exists prior to the proposed action, including other Federal activities in the area affected by the proposed action which are related to the proposed action. The interrelationships and cumulative environmental impacts of the proposed action and other related Federal projects shall be presented in the statement. The amount of detail provided in such descriptions should be commensurate with the extent and expected impact of the action, and with the amount of information required at the particular level of decision making (planning, feasibility, design, etc.)... Agencies should also take care to identify, as appropriate, population and growth characteristics of the affected area and any population and growth assumptions used to justify the project or program or to determine secondary population and growth impacts resulting from the proposed action and its alternatives (45, p. 20553).

This portion of the guidelines continues by suggesting that population projections compiled for the Water Resources Council by the Bureau of Economic Analysis of the Department of Commerce and the Economic Research Service of the Department of Agriculture (the "OBERS" projection) be used.

The final portion of the section states "in any event it is essential that the sources of data used to identify, quantify or evaluate any and all environmental consequences be expressly noted" (45, p. 20553).

The Corps Regulation addresses this EIS requirement as follows:

Describe the area, the present level of economic development, existing land and water uses, existing water supplies and water quality, air

quality, present methods of waste disposal, and other environmental determinants. Discuss in detail the environmental setting of the immediate project area with appropriate reference and discussion of important regional aspects critical to the assessment of environmental impacts. Include appropriate information on topography, vegetation, animal life, historical, archeological, geological features, and social and cultural habits and customs. Discuss population trends and trends of agriculture and industry and describe what the future environmental setting is likely to be in the absence of the proposed project. In discussing population aspects, consideration should be given to using the rate of growth in the region contained in the projection compiled by the Bureau of Economic Analysis of the Department of Commerce and the Economic Research Service of the Department of Agriculture called 'OBERS.' In any case, the source of population data used should be identified. It is possible and often desirable to treat the project setting in relation to river basins, watersheds or functional ecosystems. Discuss the inter-relations of projects and alternatives proposed, under construction or in operation by any agency or organization (43, p. C-3).

Most of the information required under the environmental-setting provision is in addition to information needed to satisfy the project description section. However, a general showing of interrelationships between projects is included in both sections. Although there is some overlap, some differences exist in the two provisions. First, the project description section requires a showing of compatibility between the proposed action and other existing or proposed Corps or other agency projects. The environmental setting section only requires a showing of interrelations of the proposed action and any projects and alternatives proposed, under construction or in operation by any

agency or organization. So, it follows that there is no need for showing compatibility between the proposed action and other projects or proposals under the environmental setting provision, but the circle of concern in this section moves beyond the actions of agencies to include actions by organizations which may not necessarily be agencies. It is this context that will be used in the EIS evaluation.

Nineteen elements were identified as required by the regulation to be discussed in the environmental setting paragraph. These are listed in Table III along with the percentages in the sample that were found to be in compliance with the requirement. These results are discussed individually in the following paragraphs.

TABLE III

EIS REQUIREMENTS FOR ENVIRONMENTAL  
SETTING WITHOUT THE PROJECT

<u>Environmental Setting Elements</u>	<u>Percent of Statements Satisfying Requirement</u>
Area Description	100
Level of Economic Development	94
Existing Land and Water Uses	94
Existing Water Supplies	58
Water Quality	88
Air Quality	23
Present Methods of Waste Disposal	35
Environmental Setting for Immediate Project Area	100
Regional Aspects	100

TABLE III (Continued)

Environmental Setting Elements	Percent of Statements Satisfying Requirement
Topography	100
Vegetation	82
Animal Life	94
Historical and Archeological Features	88
Geological Features	88
Social and Cultural Habits and Customs	47
Population Projections	70
Agricultural and Industrial Trends	76
Future Environmental Setting	76
Interrelationships with Other Pro- jects	70

The area description, the environmental setting of the immediate project area, regional aspects and topography were generally found to be satisfactory; therefore, further discussion of these aspects is not warranted.

Levels of economic development were discussed in all statements, but in one case, the discussion was considered inadequate for statement purposes. However, generally, the response was considered satisfactory in this area.

Existing land and water uses were also adequately discussed, except in one instance the discussion was not sufficient to describe the project setting properly. This inadequacy was found in the same statement that did not discuss levels of economic development sufficiently. The overall response to this element is considered satisfactory.

Only fifty-eight percent of the statements presented existing water supplies in a satisfactory manner. All statements which were inadequate in this category were primarily concerned with either flood control or beach erosion control. For these type projects, impacts on water supply systems, if any, would be a secondary or indirect impact. If there is potential for impacts, it follows that the existing water supply systems should have been described or discussed.

The lowest response was in regard to air quality. Only twenty-three percent of the statements discussed this aspect of the environment. Several other statements mentioned air quality, but the discussion was inadequate. Again, for a water resource project, air quality impacts are secondary and indirect; however, this does not preclude their coverage in the EIS.

Present methods of waste disposal were discussed only in thirty-five percent of the statements. In all cases, the discussion was directed to sewage treatment plants and other methods of waste water disposal. Conceivably, solid wastes could be a factor in the planning of a water resource project, but it was impossible to determine from the documentation whether this applied to any of the projects studied. Again, most projects where this element was omitted were either flood control or beach erosion control projects where the considerations of waste disposal would be secondary to the project purposes. Nevertheless, the



topic should have been addressed.

The discussion of vegetation or flora was generally adequate. Several statements did not include a discussion of this aspect of the natural environment, but the projects involved were located in highly urbanized areas where there was little vegetative cover if any in the project area. Therefore, this deficiency does not seem to be as significant as it might first appear. In one statement, the discussion was found to be inadequate and the project was located in an environment with significant flora.

Animal life or fauna followed about the same pattern as vegetation. In one case, the only significant animal population was an abnormally high rat population which is not desirable from the human environment standpoint. The project was located in a deteriorating urban environment.

Historical, archeological, and geological discussions followed about the same pattern. These were omitted where projects were proposed in a highly urbanized setting. The fact that the project is in a highly urbanized setting does not diminish the importance of these topics and they should be adequately discussed in the environmental setting section.

The discussions of social and cultural habits and customs were generally found to be inadequate. These form a very important part of the human environment and should be fully covered in the environmental setting section. Information gathered to make a social impact assessment

under the requirements of Section 122 of the 1970 Rivers and Harbors Act (48) should have provided a good source of information for the EIS. In fact, Section 16a of ER 1105-2-507 (43) requires that information for the social impact assessment be used in the EIS process.

The requirements for population projections were discussed in detail in both the CEQ Guidelines and the Corps Regulation. These regulations required that the methodology used should be fully documented and substantiated. Seventy percent of the statements were found to be adequate in view of the standard set by the guidelines and regulations. In some instances no population projections were presented.

Agricultural and industrial trends were discussed adequately in seventy-six percent of the statements. The statements that were inadequate involved environs which were not agricultural or industrial in nature, so the importance of a detailed discussion of this aspect is somewhat diminished.

The recognition that the environment, whether it be natural or otherwise, is evolving or changing as evidenced by the requirement that the future environmental setting should be discussed. Only seventy-six percent of the statements covered this aspect adequately.

As mentioned earlier, showing the relationship to other projects does not mean there must be a showing of compatibility, but other projects could include something

other than projects proposed by agencies. Among some of the projects considered were actions by citizens groups, relationships to transportation systems, bridges, utilities and various other activities in the vicinity of the project. Seventy percent of the statements were found to be adequate.

#### Relationship to Land Use Plans

The third section in the EIS discusses the relationship of the proposed action to land use plans. In this regard, the CEQ Guidelines state:

This requires a discussion of how the proposed action may conform or conflict with the objectives and specific terms of approved or proposed Federal, State, and local land use plans, policies, and controls, if any, for the area affected including those developed in response to the Clean Air Act or the Federal Water Pollution Control Act Amendments of 1972. Where a conflict or inconsistency exists, the statement should describe the extent to which the agency has reconciled its proposed action with the plan, policy or control, and the reasons why the agency has decided to proceed notwithstanding the absence of full reconciliation (45, p. 20553).

The Corps Regulation, ER 1105-2-507 describes what is required in regard to this section as follows:

Discuss how the proposed project or action conforms or conflicts with the objectives and specific terms of existing or proposed Federal, State, and local land use plans, policies and controls, if any, for the area affected. If a conflict should occur, the statement should discuss the issues completely and state the actions that the Corps has taken to reconcile its proposed action with the plan, policy or control, and the reasons for proceeding with the project notwithstanding the absence of full reconciliation (43, p. C-4).

Criteria were developed to evaluate the response in the sample of statements. The criteria and results are shown in Table IV.

TABLE IV  
RELATIONSHIP TO LAND USE PLANS

EIS Response	Percent of Sample
No comment	35
No existing land use plan	24
No conflict with land use plan	<u>41</u>
TOTAL	100

All statements that responded to this portion of the regulation indicated either there is no adopted land use plan in the project area; or if a plan is adopted, it is not in conflict with the proposed action. Since land use planning is not widely accepted, an evaluation of potential conflicts is of limited value at this time. However, the importance of this section is expected to increase as land use planning develops as a planning tool.

Environmental Impact of the  
Proposed Action

The fourth section contains the first of five requirements explicitly stated in NEPA. In Subsection 102(2)C, NEPA states:

include in every recommendation or report.... a detailed statement by the responsible official on the environmental impact of the proposed action (1, p. 428).

This requirement is expanded in the CEQ Guidelines as follows:

This requires agencies to assess the positive and negative effects of the proposed action as it affects both the national and international environment. The attention given to different environmental factors will vary according to the nature, scale, and location of proposed actions.

Secondary or indirect, as well as primary or direct, consequences for the environment should be included in the analysis. Many major Federal actions, in particular those that involve the construction or licensing of infrastructure investments (e.g., highways, airports, sewer systems, water resource projects, etc.), stimulate or induce secondary effects in the form of associated investments and changed patterns of social and economic activities. Such secondary effects, through their impacts on existing community facilities and activities, through inducing new facilities and activities, or through changes in natural conditions, may often be even more substantial than the primary effects of the original action itself (42, p. 20553).

The Corps Regulation ER 1105-2-507 (43) also discusses the types of information to be included in this section. This portion of the regulation is rather lengthy and somewhat superfluous to the need to define content of the EIS here. Therefore, the content of the regulation is summar-

ized in the following paragraphs.

The regulation requires impacts of the proposed action on land, water and air be initially identified and projected throughout the project life. Land losses and land use changes should be identified. Project-induced primary and secondary economic and social effects should be discussed with emphasis on their impacts on the environment. Qualitative descriptions of unquantifiable environmental costs and benefits should be provided with assumptions or criteria on which judgments are based. Both beneficial and adverse impacts should be discussed. Effects of the proposed action should be discussed not only in reference to the project area, but also in relation to the applicable region. Interrelationships of projects and alternatives proposed should be discussed. Remedial, protective, and mitigation measures which would be taken as a part of the proposed action should be identified.

An attempt was made to categorize the impacts and evaluate the response in an orderly manner. This approach proved to be impossible due to the wide range in types of projects and the variety of impacts which were peculiar to the individual situations. However, several general comments can be made in regard to the content in this section for the sample of statements studied.

In general, both beneficial and adverse effects were presented objectively. Quantification of the impacts was sparse and seemed to be concentrated in areas of

beneficial impacts or effects. Generally, where the proposed project had regional implications, these were discussed. Economic effects, direct and indirect were generally discussed, but seldom quantified. In one statement a benefit-to-cost ratio was presented in the impact section rather than in the project description section as the regulation requires. That did not create a significant problem. Social impacts such as community cohesion and increases or decreases in anxiety were seldom discussed; however, the fact that a certain number of families would have to be relocated was usually presented. Archeological impacts were omitted in a number of statements and in one case archeological sites were identified in the section for the environmental setting without the project, but were never related to the project. The environmental impact section would seem to be the logical place to present this information.

#### Adverse Environmental Effects

The second requirement in NEPA, Subsection 102(2)C states the EIS should contain:

...any adverse environmental effects which cannot be avoided should the proposal be implemented (1, p. 428).

This has been expanded in the CEQ Guidelines as follows:

This should be a brief section summarizing in one place those effects discussed in

paragraph (a)(3) of this section that are adverse and unavoidable under the proposed action. Included for purposes of contrast should be a clear statement of how other avoidable adverse effects discussed in paragraph (a)(2) of this section will be mitigated (45, p. 20554).

In regard to this section the Corps Regulation ER 1105-2-507 states as follows:

Discuss the detrimental or adverse aspects of the proposed action which cannot be eliminated by alternative measures of the proposed action. This discussion will identify the nature and extent of the adverse effects, the resources affected and summarize those adverse and unavoidable effects of the proposed action discussed in subparagraph d. It should include a discussion of adverse effects or objections raised by others. The loss of a given acreage of wetland by filling may be mitigated by purchase of a comparable land area, but this does not eliminate the adverse effect. Certainly the effects on the altered elements will not disappear simply because additional land is purchased. Identify the nature and extent of the principal adverse effects and the parties affected. For example, the effects of the filled wetland might include the loss of shellfish through sedimentation actions (turbidity and burial), the loss of organisms through the leaching of toxic substances from polluted marsh sediments used in the fill, the loss of a popular/valuable waterfowl census site in the estuary or the burial of ancient Indian midden sites of indeterminate archeological value (43, p. C-6).

A study of the sample of statements revealed several generalizations about this particular section. The majority of the responses were very general, amounted to less than a page and a half and in eighty percent of the statements merely reiterated what was stated in the environmental impacts section. Mitigation was mentioned in about one-third of the statements and then in only very general



terms. The adverse impact section of three of the statements merely contained reference to subparagraphs in the preceding impact section which discussed adverse impacts. Often the discussion involved environmental impacts which are expected to occur during construction activities and recommended mitigation measures in a very general manner.

Based on the observation made in this sample of statements, this section appeared to have very little value. It did, however, concentrate in one section a discussion of adverse impacts which would not be hidden among a number of beneficial impacts. This problem will be discussed in more detail at the end of this chapter.

#### Alternatives

Subsection 102(2)D of NEPA requires the agency contemplating a major Federal action accomplish the following:

...study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources (1, p. 428).

Subsection 102(2)C of NEPA requires the display and discussion of alternatives to the proposed action in the EIS. The CEQ Guidelines describe in more detail the requirements of considering alternatives to the proposed actions. In this regard the Guidelines state:

A rigorous exploration and objective evaluation of the environmental impacts of all reasonable alternative actions, particularly those that might enhance environmental quality or avoid some or all of the adverse environ-

mental effects, is essential. Sufficient analysis of such alternatives and their environmental benefits, costs and risks should accompany the proposed action through the agency review process in order not to foreclose prematurely options which might enhance environmental quality or have less detrimental effects. Examples of such alternatives include: the alternative of taking no action or of postponing action pending further study; alternatives requiring actions of a significantly different nature which would provide similar benefits with different environmental impacts (e.g., nonstructural alternatives to flood control programs, or mass transit alternatives to highway construction); alternatives related to different designs or details of the proposed action which would present different environmental impacts (e.g., cooling ponds vs. cooling towers for a power plant or alternatives that will significantly conserve energy); alternative measures to provide for compensation of fish and wildlife losses, including the acquisition of land, waters, and interests therein. In each case, the analysis should be sufficiently detailed to reveal the agency's comparative evaluation of the environmental benefits, costs and risks of the proposed action and each reasonable alternative (45, p. 20554).

In regard to alternatives to be included in the EIS, the Corps Regulation ER 1105-2-507 states:

Describe the various reasonable structural and non-structural alternatives to the proposed action, their environmental impact, their ability to accomplish the objectives, either in whole or part, of the proposed action, specifically taking into account the alternative of no action.....In discussing the various alternatives to accomplish the objectives of the proposed action, three general categories should be followed: (1) Describe those alternatives which would accomplish all of the objectives of the proposed action, (2) describe those alternatives which may only provide a partial solution to all or part of the objectives of the project, as one example including land acquisition or other land use controls in the flood plain in the case of flood control projects, and (3) describe the no development alternative. Rules of reasonableness must also be followed in deciding what alternatives are proper subjects

for discussion.....The fact that an alternative action cannot be implemented by the Corps does not by itself make the alternative not reasonably available. If alternatives requiring action by another agency or legislative action are not remote or speculative possibilities, they must be discussed in the statement.....Reasonably available alternative actions and responsible views in opposition to a proposed action which are contained in comments on the environmental impact statement submitted by interested citizens or citizens' groups must be discussed (43, p. C-6).

The requirements set forth in this regulation appear to be consistent with the legal requirements developed in Chapter IV. First, the "no action" alternative must be considered; and secondly, the scope of alternatives must go beyond the powers of the agency to implement the plan, if it appears reasonable to do so. The Corps Regulation goes one step further than the court cases indicate and require consideration of reasonable alternatives offered or suggested by interested citizens or citizens' groups.

The sample of statements was examined taking into account the requirements for the alternatives section. Again, as with the attempt to categorize impacts, the high degree of variability in problems to be solved and in the solutions considered made it difficult to completely analyze the response in an orderly manner. However, several aspects were considered general enough to analyze on a uniform basis. These aspects are shown in Table V.

The no action alternative discussion was included in all cases therefore no further comment is warranted.

TABLE V  
EIS REQUIREMENTS FOR ALTERNATIVES  
TO THE PROPOSED ACTION

<u>Alternatives Section Elements</u>	<u>Percent of Statements Satisfying Requirement</u>
No Action Alternative Considered	100
Structural and Nonstructural Alternative Considered	65
Beneficial and Adverse Impacts Discussed	58
Proposed Action Included as Alternative	77
Scope of Alternatives Adequate (No action to objective accomplishment)	94
Mitigation of Adverse Impacts in Alternative Selection	41
Alternatives Considered Beyond Corps Authority	58

The percentage of projects where nonstructural alternatives were considered appears rather low. The need to consider the nonstructural alternative was assumed to be something more than the "no action" alternative. The projects where nonstructural measures were omitted involved types of problems where the nonstructural solution does not apply such as beach erosion projects, navigation projects and lock replacement projects. If the objective is

to prevent beach erosion, and the objective is site specific, it's difficult to think of a nonstructural measure that will accomplish the objective. In addition, if the objective is to deepen a harbor or to replace a lock and dam, it's difficult to achieve the objective without some type of structural measure. In these cases, partial accomplishment of the objectives were considered and in most instances placement of spoil material was the real issue.

In general, the discussion of beneficial and adverse impacts of each of the alternatives appeared to be inadequate. Most of the discussion was oriented to achievement of the project purposes and economic accomplishments of the proposed plan. Probable adverse and beneficial environmental impacts were either considered minimal or the discussion in the previous sections was considered adequate. However, improvement in this area would facilitate a much better use of the EIS.

Discussion of mitigation of adverse environmental impacts was also considered inadequate. Only forty-one percent of the statements accomplished this in a satisfactory manner. It is possible mitigation aspects were considered more than the alternative sections indicate, but just as discussion of beneficial and adverse impacts are considered necessary, so is the discussion of mitigation measures. It seems this is at the heart of the intent behind NEPA.

The discussion of alternatives which are beyond the

authority of the Corps to implement was found in fifty-eight percent of the statements reviewed. Again, in some situations where the objectives were localized and the scope of measures to achieve the objectives small, a discussion of alternatives beyond Corps authority would not be warranted.

In twenty-three percent of the statements, the proposed action was not discussed or compared in the alternatives section. No doubt this resulted from a very literal interpretation of the section title "Alternatives to the Proposed Action." The intent to balance economic costs and benefits with those of the environment would be better served if the proposed action were included for consideration. Obviously, the proposed project is described in detail at the first of the report; however, since the selection of alternatives is so crucial to implementing the intent of NEPA, it appears a duplicative effort in the alternative section would be desirable.

The comments of citizens or groups of citizens were checked for additional suggested alternatives. In two cases, further study of additional alternatives was suggested. In each case the request was denied. In one case, the alternative suggested was not economically justified and therefore no Federal interest would be found to implement the plan. In the second case, the local interests had rejected the plan, and it was therefore not implementable. In both cases the alternatives would not

be considered "reasonably available" as required by the regulation and their omission was justified.

#### Short-Term Uses Versus Long-Term Productivity

The fourth item required in an EIS by NEPA is a discussion of the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity. The CEQ Guidelines states the following in regard to this section:

This section should contain a brief discussion of the extent to which the proposed action involves tradeoffs between short-term environmental gains at the expense of long-term losses, or vice versa, and a discussion of the extent to which the proposed action forecloses future options. In this context short-term and long-term do not refer to any fixed time periods, but should be viewed in terms of the environmentally significant consequences of the proposed action (45, p. 20554).

The Corps Regulation, ER 1105-2-507 sets forth the Corps requirements for this section:

Assess the cumulative and long-term impacts of the proposed action with the view that each generation is a trustee of the environment for succeeding generations. Give special attention to considerations that would narrow the range of beneficial uses of the environment or post long-term risks to health or safety. The propriety of any action should be weighed against the potential for damage to man's life support system - the biosphere - thereby guarding against the short-sighted foreclosure of future options or needs. It is appropriate to make such evaluations on land-use patterns and development, alterations in the organic productivity of biological communities and ecosystems and modifications in the proportions of environmental components (water,

uplands, wetland, vegetation, fauna) for a region or ecosystem (43, p. C-8).

The interpretation of the title to this section varied considerably in the statements which were reviewed. One interpretation is that this section discusses what the people give up for what they get. Most statements reiterated what the project would accomplish in terms of flood control, navigation, or recreation. Some discussed impacts of construction on a short-term basis and project accomplishments on a long-term basis. In one case, there was an indication the environment would degrade with or without the project and in another case the comment indicated the aesthetics of the project area could not be maintained without the proposed beach erosion control project. While interpretations of this section varied, in general no information was presented which had not been discussed in previous sections. While this section contains a concept which should certainly be utilized, it appears that explicit instructions should be provided for its use or the concept should be incorporated into one of the sections previously discussed. As mentioned in Chapter IV, the language for this section resulted from a compromise. This compromise resulted in a showing of the relationship between short-term uses of the environment and long-term productivity rather than "consistency between" these short-term and long-term aspects. This apparently has taken meaning from the phrase; and while the



phrase can be useful, it should be used in some other manner.

### Irreversible and Irretrievable

#### Commitments

The final element required by NEPA to be included in the EIS involves a discussion of any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. The CEQ Guidelines state the following in regard to this requirement:

This requires the agency to identify from its survey of unavoidable impacts in paragraph (a)(5) of this section the extent to which the action irreversibly curtails the range of potential uses of the environment. Agencies should avoid construing the term 'resources' to mean only the labor and materials devoted to an action. 'Resources' also means the natural and cultural resources committed to loss or destruction by the action (45, p. 20554).

The Corps Regulation, ER 1105-2-507 expands this requirement as follows:

Discuss irrevocable uses of resources, changes in land use, destruction of archeological or historical sites, unalterable disruptions in the ecosystem, and other effects identified in subparagraph e. to the extent to which the action irreversibly would curtail the diversity and range of beneficial uses of the environment should the proposal be implemented (43, p. C-8).

From the above regulations and guidelines, a list of items to be discussed in this section was developed and the sample of statements reviewed for compliance. The

results are shown in Table VI.

TABLE VI  
EIS REQUIREMENTS FOR IRREVOCABLE  
COMMITMENT OF RESOURCES

Irrevocable Commitment Section Elements	Percent of Statements Satisfying Requirement
Irrevocable Resource Commitment	76
Land Use Changes	59
Archeological Sites Lost	12
Ecosystem Disruption	70
Labor and Materials Lost	65

The responses to the requirements for the discussion of irrevocable commitment of resources was somewhat varied. In one EIS, the position was taken that there are no irreversible and/or irretrievable resource commitments associated with the proposed project. Only through a lack of project implementation would such an irretrievable loss of resources occur. This view seemed somewhat extreme. At the other extreme, good faith attempts were made to respond to the requirements for this section.

In general, about sixty to seventy percent of the

statements responded to the specific items set forth in the regulation. The response to the requirement for discussion of archeological sites amounted to only twelve percent of the sample. This seems consistent with the limited response which has been given this topic in the previous sections.

The responses to this section were too general and somewhat repetitive. Again, the concept presented in this section is good, but the response to it has had but little value.

#### Coordination

A study of the coordination conducted in the EIS process revealed that in general it was adequate. Only one statement showed the coordination to be incomplete. Detailed responses to all questions raised by individuals, governmental agencies and local organization were included at the end of each statement. The answers to the questions raised in general were objective and obliging. Interviews with persons who review the EIS in the Corps review process revealed that most often the reviewer finds more productive information in this portion of the statement than in the foregoing sections. It follows that responses to the coordination effort required by NEPA has been a real source of information for the decision maker and to that extent, the intent of the promulgators of NEPA has become a reality.

## General Considerations

Subsection 102(2)A of NEPA requires that a systematic, interdisciplinary approach shall be used to insure integrated use of the natural and social sciences with the environmental design acts in planning and decision-making. No documentation is required, but some planners have developed a matrix to illustrate the results of systematic, interdisciplinary approach. Five of the statements reviewed contained either a matrix showing alternatives versus economic, social and environmental facets or an organized table of impacts. In one statement, an outline of environmental and economic information along with a map of the action being considered was shown for each alternative. This approach is considered good, if numbers are not assigned on a purely judgmental basis. Most of the statements in the sample merely had verbal descriptions of impacts and did not use a numbering system. The systematic approach allows one to consider all the interrelating factors at the same time, and approaches the balancing of economic and environmental considerations as required by NEPA and the case law it has generated.

In general, about half of the material presented in the statements was too technical for public understanding. Often long lists of scientific names submitted by the biologist and tables of engineering data, while being technically correct, were beyond the comprehension of the

layman. Water quality data was often given with no explanation of units or no water quality standards for comparison. In some cases, the parameters displayed did not appear to be a problem and parameters omitted appeared to have potential as problem areas. This suggests that available data may have been included in the statement without regard to the true water quality problems. In one instance total dissolved solids were shown to be about 2000 parts per million which is far above the allowable standard. No discussion was included to show the effect of this water quality parameter on the project or the effect of the project on this water quality parameter. In other statements water quality was discussed in general terms. In one case the only reference to the effect of the project was that the long-term water quality will not be degraded by the project. No supporting data was shown to substantiate this statement.

Generalizations and rationalizations were also presented without sufficient basis in the alternatives discussion. An example of this is a statement found in the alternatives section. The alternative was not considered further because the adverse impacts outweigh the beneficial ones and because the plan would not be economically justified. No attempt was made to define what is beneficial, what is adverse or what is meant by economic justification.

In spite of these shortcomings, other statements were well written, relatively complete and represented a good

effort to comply with the letter and intent of the law.

### Suggestions for Improvement

As mentioned earlier, responses to some of the nine sections overlapped and the same information was repeated. Five sections are considered adequate. These would be the description, impacts, the environmental setting, alternatives and coordination sections. Certainly, as expressed before, there is a need to describe the proposed action for proper review. This would be followed by a detailed description of the environmental setting without the project. The third section would contain impacts, both beneficial and adverse. A summary of the impacts, environmental or otherwise would be included with each alternative and the tradeoffs identified in the plan selection. In this process of alternative selection, consideration could be given to the relationship of short-term resource commitments and long-range productivity. Also, irrevocable resource commitments could be displayed in the alternatives section. A detailed discussion of these suggestions are contained in the following paragraphs.

Requirements for the description of the project section, the coordination section and the section describing the environmental setting without the project are considered adequate and no change or additional requirement is proposed.

The section showing the relationship of the proposed

action to land use plans should not be a separate section. However, as mentioned earlier, as land use planning becomes more widely accepted, the importance of this consideration will increase. It is suggested that the content of this section be set forth in the impacts section and the alternative section as may be appropriate. A consideration of impacts of the proposed action would include impacts on land use plans. Therefore, a description of compatibility or conflicts with land use plans would be appropriate in the impacts section.

If one alternative conflicts with the land use plan more than another alternative, a discussion of this aspect would be appropriate in the alternatives section of the EIS. This approach would avoid segmenting different portions of the impacts and alternative analysis into separate sections.

The section containing environmental impacts of the proposed action is a very important aspect of the statement. Care should be taken to present both beneficial and adverse impacts in an objective manner. Also, the impacts identified in this section should relate to those shown in the alternatives section as will be suggested in a later paragraph. It is suggested that detailed environmental impact information be presented in this section, and in the alternatives section the environmental impact should be summarized to the extent that only those impacts which relate to the balancing process need be shown. Since impacts

vary from project to project, no systematic method is suggested for presenting them.

The final section to be discussed is the alternatives section. Many efforts have been made to display the information in the alternatives section in a systematic fashion and to catalogue various impacts under systematic designations of parameters and components. There are numerous ways to approach this and each has its weak and strong aspects. The intent here is not to analyze these systems, but to suggest that some features be added to the selected system to incorporate topics which historically have been shown in other sections.

Traditionally, separate sections have been used to describe adverse impacts which cannot be avoided, irreversible commitments of resources, and the relationship between short-term resource use and long-term productivity. Table VII shows a proposed method to display the alternatives section. In addition to the separate section information, some supplemental information concerning the impacts should be included, such as whether or not the impact is beneficial, and the area of influence. Any set of parameters and components could be used in the parameters and components column. It is assumed that long-term, short-term, avoidable, irreversible, and other aspects would be defined in footnotes and most impacts would be described in detail by narrative.

This arrangement of information would facilitate a



TABLE VII  
PROPOSED DISPLAY OF ALTERNATIVES

Parameters and Components	Alternative A- Plan Description			
	Effects			
	+ Beneficial			
	0 Insignificant Adverse	S-Short term L-Long term	A-Avoidable N-Nonavoidable	R-Reversible I-Irreversible
<u>Natural Environment</u>				
I. Unique, Rare, Threatened, or Important Species				
A. Plants				
B. Animals				
II. Plant & Animal Habitat				
A. Aquatic				
1. Lotic (flowing)				
a. quality				
b. quantity				
(continued)				
<u>Human Life Quality</u>				
I. Recreational Opportunities				
A. Water				
1. Sport Fishing				
a. Stream				
b. Lake				
(continued)				
<u>Economics</u>				
I. Project Efficiency				
II. Gross Local & Regional Output				
A. Income				
1. Wage & Salary				
2. Other				
(continued)				

balancing of environmental amenities and economic and technical considerations thereby fulfilling the intent of the law.

### Summary and Conclusions

Development of the EIS evaluation criteria revealed that the Corps regulations either reiterated or expanded the CEQ Guidelines requirements.

Examination of the sample of EIS's showed that the content generally fell short of compliance with the standards set by the guidelines and regulations. The quality of the EIS's was somewhat varied. Length of EIS's in sample varied from seven pages to several hundred pages with discussion being incomplete in places, yet highly detailed in other instances. The general impression is that from a procedural standpoint the quality has not improved greatly since the study by Ortolano and Hill (17).

The degree of compliance was often displayed by percents of the sample which appeared to comply with particular elements required by the guidelines and regulations. These values are highly judgmental and are not intended to be used in a precise manner. Their value is in showing patterns where shortcomings are more prevalent. Certainly a value of fifty percent or seventy percent is meaningless unless there is some standard with which to compare. However, where certain elements drop significantly below the average percentages of all elements, deficient areas are

uncovered. The analysis showed that air quality, sociological, archeological and historical aspects were most often neglected. Chapter VI results indicate that staffing in these disciplines is lower than in the areas of the natural sciences and engineering. These results suggest that the Corps should give more emphasis to these areas of concern to more fully implement the intent of NEPA.

Reorganizing the information in the various sections as discussed in detail previously is also considered an improvement over methods presently used.

## CHAPTER VI

### SUBSTANTIVE EFFECTS OF NEPA

The ultimate goal intended to be achieved by NEPA is not necessarily accomplished by perfection in the procedural processes of Section 102. In other words, compliance with the procedural rules does not necessarily implement the national environmental policy as the framers of NEPA intended. The purpose of this chapter is to look beyond procedural concepts to the results of NEPA in the formulative processes of water resource development. First, data developed on a Corps-wide basis will be examined for certain trends to evaluate the character of the NEPA impact on water resource planning. Secondly, a case study approach is used for the in-depth analysis to reduce the number of major Federal actions to a manageable number.

#### Corps-Wide NEPA Effects

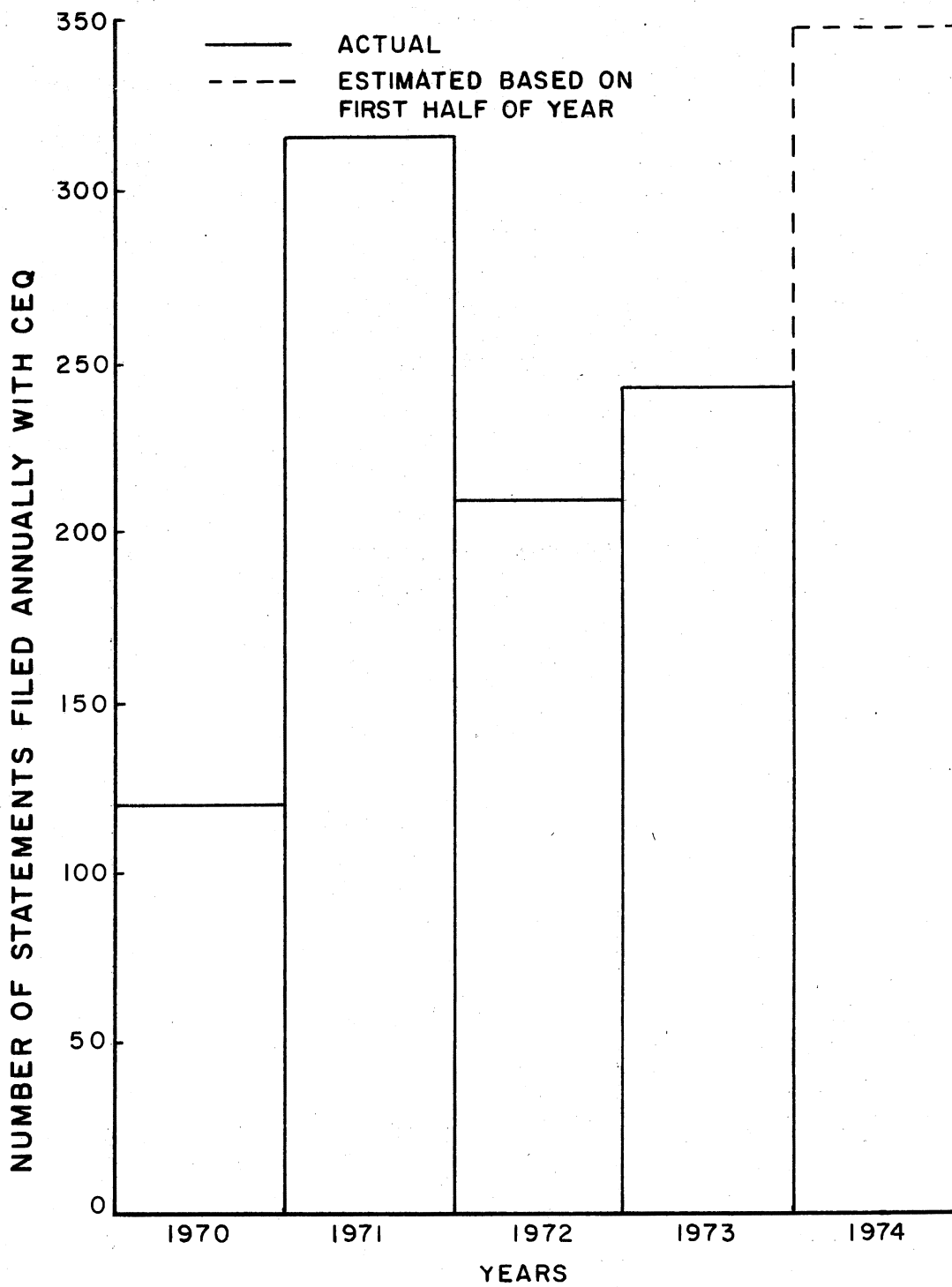
The Corps is second only to the Department of Transportation in total numbers of Environmental Impact Statements filed with CEQ. As of July 1, 1974, the Department of Transportation had generated 2,656 Environmental Impact Statements (3, p. 390). The annual distribution of these 1,063 Environmental Impact Statements by the Corps is shown

in Figure 1. This shows that the annual rate of filing the EIS's peaked in 1971, dropped in 1972, and began to rise in 1973 and 1974. The peak in 1971 is probably explained by the gathering momentum of the environmental movement and the fact that a backlog of projects in the planning process needed environmental evaluation.

The effects of NEPA on the 1063 projects were determined from data developed in the Corps Office of the Chief of Engineers in Washington, D.C. These effects were categorized as projects or studies modified due to NEPA, projects or studies delayed due to NEPA, and projects or studies stopped due to NEPA. The number of projects and percentages of the total number of EIS's filed is shown in Table VIII.

TABLE VIII  
CORPS PROJECTS AND STUDIES AFFECTED  
BY NEPA AS OF JULY 1, 1974

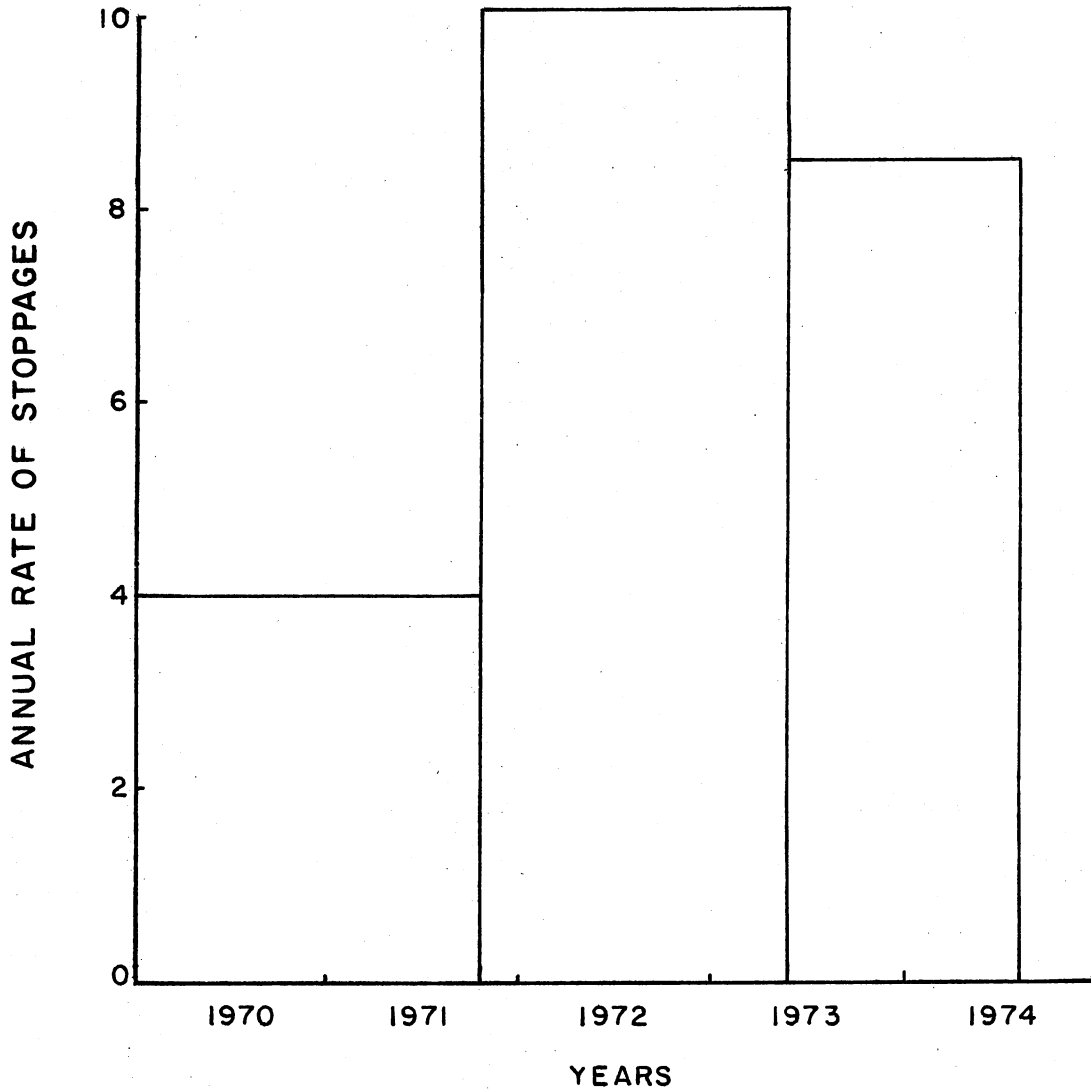
Category of Effect	Number of Projects or Studies Affected	Percent of Pro- jects Affected
Projects or Studies Modified	249	23
Projects or Studies Delayed	68	6
Projects or Studies Stopped	<u>33</u>	<u>3</u>
TOTAL	350	32



NUMBER OF CORPS STATEMENTS FILED WITH CEQ  
FIGURE - I

Table VIII shows that about one project out of three, which the Corps has planned, designed or built has been affected in some way by NEPA. Whether or not the delays will ultimately result in a stopping of the project or in project modification is uncertain at this time.

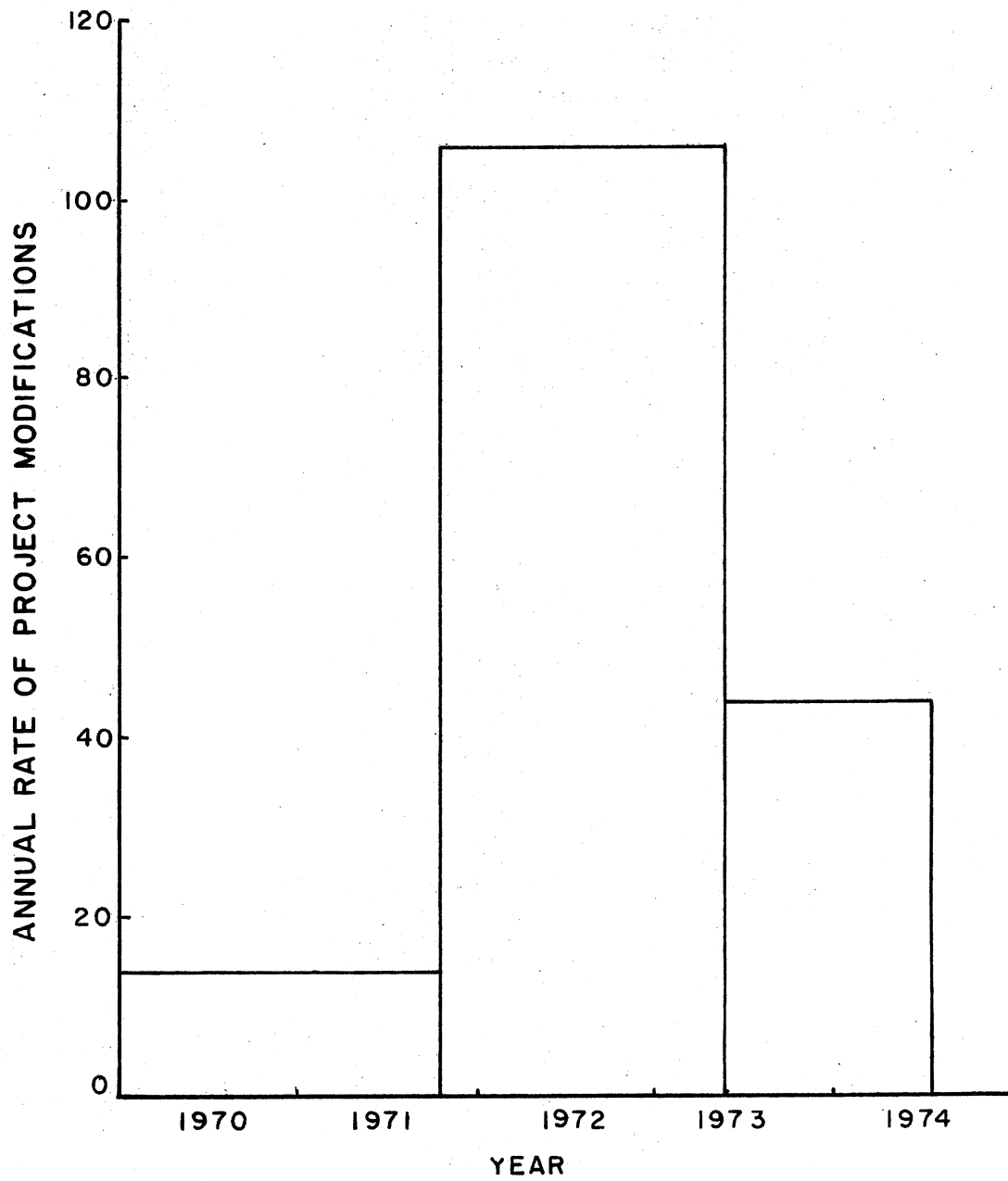
The time distribution of project stoppages was determined by using data which has been reported previously. In 1972, Andrews reported in his dissertation that seven projects had been halted in response to NEPA by the Corps as of October 15, 1971 (19, p. 245). These stoppages had occurred after the passage of NEPA. May, 1973 was selected as an interim point to help define the rate of project stoppages. These data plus data shown in Table VIII were combined and shown in Figure 2. This shows the annual rate of projects stoppages increased in 1972, but that the rate reduced in 1973. The reduction in the 1973 rate was not as severe as the reduction in project modifications which will be shown next. Projects modified by NEPA were analyzed and the rate of project modification follows the same pattern as project stoppages and is shown in Figure 3. While no correlation would be expected, it is interesting to note that the annual rate of generating Environmental Impact Statements is increasing yet the annual rate of project stoppages and modifications is decreasing. This suggests that either the effectiveness of NEPA is diminishing, or it could also be explained by better environmental planning. The case study involving



CORPS OF ENGINEERS RATE OF PROJECT STOPPAGES DUE TO NEPA

FIGURE - 2





**CORPS OF ENGINEERS RATE OF PROJECT MODIFICATIONS DUE TO NEPA**

**FIGURE - 3**

the impact of NEPA on the Tulsa District, Corps of Engineers will help define the causes of this phenomenon although the Tulsa District involves only a small percentage of Corps activity and the results cannot be considered absolutely conclusive.

Another aspect of NEPA impacts which was studied on a Corps-wide basis was a determination of the influences which induced the project modifications, delays and stoppages. The results of these studies are shown in the following tables.

Project modifications by NEPA were examined to determine the source of influence which induced the modification and the results are shown in Table IX.

These results show that the bulk of the influence originates internally or in coordination with other agencies. Also, local citizens were responsible for about twenty percent of the project modifications. Environmental groups were responsible for only about ten percent.

The same type of approach was taken for projects that were stopped by NEPA. The results are shown in Table X.

The percent of the projects stopped internally for the Corps or by local citizens did not change significantly from the percentage shown in the project modification sources. However, environmental group activity in stoppage was considerably higher than in project modifications. Also, the percentage of projects stopped by coordination at the state level is considerably lower than in the area of

project modification.

TABLE IX  
SOURCES OF NEPA MODIFICATION  
TO CORPS PROJECTS

Source of Modification	Percent of Modified Projects
Internal (Corps)	22
Local Citizens	19
Environmental Groups	9
Other Government Agencies	24
State	21
Local Government or Agency	4
Interaction of Numerous Factors	<u>1</u>
TOTAL	100

The pattern of sources of influence for project delays is very similar to that for project modifications. These are shown in Table XI.

Generally, the data shown in Table XI suggests that about three out of four changes to Corps projects are caused by external forces. This gives some credence to the position taken by Senator Muskie in the passage of NEPA

where he suggested that self policing of Federal agencies is not workable. A large part of the change induced by the Act resulted from the coordination aspects of NEPA which Senator Muskie instituted. Also, the fact that the Courts elected to make NEPA a litigable law to the extent that they did apparently left its mark, particularly in the area of project stoppages.

TABLE X  
SOURCE OF NEPA STOPPAGE OF  
CORPS PROJECTS

Source of Stoppage	Percent of Projects Stopped
Internal (Corps)	25
Local Citizens	23
Environmental Groups	31
Other Governmental Agencies	9
Presidential Order	3
State	<u>9</u>
TOTAL	100

Andrews (19) in his dissertation also compared internal and external forces inducing NEPA changes. His

analysis was based on a survey and had an effective date of October 15, 1971. A comparison of his results with those developed in this study is shown in Table XII. The data in Table XII indicates a trend toward internalization of NEPA induced changes.

TABLE XI  
SOURCE OF NEPA DELAYS OF  
CORPS PROJECTS

Source of Delay	Percent of Projects Delayed
Internal (Corps)	27
Local Citizens	27
Environmental Groups	12
State	25
Local Government or Agency	1
Interaction of Several Forces	1
Other Governmental Agencies	<u>7</u>
TOTAL	100

An examination of the Corps staffing for preparation of EIS's would infer the degree of compliance of the NEPA provision which requires all agencies to utilize a systematic,

interdisciplinary approach to decision-making. The various disciplines represented in the Corps staffing for EIS preparation is shown in Table XIII. Those that spend full time on EIS preparation are shown as well as those which work on the EIS on a part-time basis.

TABLE XII  
COMPARISON OF SOURCES OF NEPA  
CHANGES TO CORPS PROJECTS

Category of Effect	Percent of Change Internally Induced	
	Present Study July 1, 1974	Andrews Study October 15, 1971
Projects or Studies Modified	22	9
Projects or Studies Delayed	27	10
Projects or Studies Stopped	25	14

The distribution in Table XIII shows that the tendency has been to hire those individuals qualified to study the natural environment. For instance, the social scientist or sociologist is not hired in great numbers to evaluate the social implication of decisions. This seems contrary to the intent of the Senate-House Conference Committee which

explicitly included the sociologist as one of the relevant disciplines which should be represented on the multidisciplinary team as was shown in Chapter IV. Also, the archeologist is not well represented and NEPA expressly states in Section 101 that one of the goals is to preserve historic, cultural and natural aspects of our national heritage.

TABLE XIII  
CORPS STAFFING FOR EIS PREPARATION

Profession or Discipline	Percent of Total Staff	
	Full Time	25 Percent of Time or More
Biologist	34	16
Civil Engineer	17	16
Environmental Planner or Specialist	8	12
Landscape Architect	6	9
Ecologist	7	2
Sanitary Engineer	4	3
Recreation Planner or Specialist	4	10
Writer	3	1
Archeologist	-	1
Social Scientist or Sociologist	2	1
Attorney	-	7
Geologist	3	1
Oceanographer	3	1
Economics	1	3
Geographer	1	3
Other	7	14
TOTAL	100	100

The bioenvironmental engineer is not widely used in EIS preparation although he possesses the knowledge to evaluate water quality problems which are usually very complex and to suggest management techniques and measures to help solve water quality problems. Overall, it seems that a better balance could be achieved in establishing a multidisciplinary team to make water resources decisions. For the environment, as defined in Chapter III goes beyond the natural environment and includes environment in the social sense as well as physical sense.

The disciplinary span could be broader than the data in Table XIII indicates. Some of the professions such as environmental planner or recreation planner could be filled with individuals with varied backgrounds; however, it is doubtful that their background involves some of the less well represented professions such as sociology and archeology.

#### The Tulsa District Case Study

The Tulsa District, Corps of Engineers was selected for a case study approach to determine the impact of NEPA on the water resource project formulation process. In Chapter IV, it was shown that NEPA, by its explicit language and through court interpretations requires that "appropriate consideration" be given to environmental amenities along with economic and technical consideration. This has been construed to mean that a "balancing" process



is to take place and where conflicts develop between environmental concerns and economic or technical factors, the trade-offs should be identified and blended into the decision-making process. If this process is implemented, in some instances the balance will favor the environmental side and the decision will be either delayed, reversed or modified. Corps-wide data showing these changes to decisions were displayed earlier in this chapter. The purpose here is to examine these decisions on a project-by-project basis, analyze the results and draw conclusions concerning these NEPA impacts. Before discussing the projects, a general description of Tulsa District is developed.

Tulsa District is one of the larger districts of the Corps, covering large portions of the Arkansas River and Red River and extending into the states of Oklahoma, Texas, Kansas, Colorado, Missouri and Arkansas. Eighty-six water resource projects have either been constructed, are being constructed, or have progressed through the planning process to become authorized by Congress. Seven additional local protection projects have been authorized by the Corps for further study under delegated Congressional authority.

The projects vary in size and complexity from small local protection flood control projects to large multipurpose reservoirs. The purposes include flood control, water supply, water quality control, recreation, fish and wildlife enhancement, hydropower, irrigation and navigation. The development of these projects has covered the basin with

water-oriented recreation areas, and extended water-borne navigation to the terminal port near Tulsa, Oklahoma. In addition, projects in the planning process are being designated to control emission of chlorides which has affected adversely water quality in a major portion of the basin.

Construction activity in the Tulsa District peaked in the mid 1960's when the navigation system, a major accomplishment became operational in 1970, the year NEPA was passed into law. However, a fairly large number of projects remained to be constructed or were in the construction phase at that time. It is these projects that will be discussed and examined in the following paragraphs. NEPA required an Environmental Impact Statement be prepared on each of these projects. The projects which fell into this category for the period of January 1, 1970 to January 1, 1976 are shown in Table XIV along with the data of filing the EIS and other pertinent information.

The EIS on file with CEQ is one of two types. It is either a draft or a final EIS. A draft EIS is one which lacks coordination and comment from other agencies. Once the coordination is complete and the comments are fully incorporated into the document, the draft EIS becomes a final EIS.

The development process for Corps water resource projects is divided into four stages. These are general investigation (GI), advanced engineering and design (AE&D), construction (C) and operational (O). All of the projects

TABLE XIV

TULSA DISTRICT PROJECTS REQUIRING EIS,  
1970 THROUGH 1975

Project	Project Type <sup>1</sup>	Type of EIS <sup>2</sup>	Date Filed CEQ
Arcadia	MP	D	November 6, 1975
Ark-Red Pt. I <sup>3</sup>	WQC	D	April 14, 1971
Ark-Red Pt. II	WQC	F	November 13, 1970
Big Hill	MP	F	October 10, 1973
Big Pine	MP	F	September 10, 1975
Birch	MP	F	September 15, 1972
Candy	MP	F	June 8, 1975
Cedar Point	MP	D	April 15, 1974
Clayton	MP	F	February 4, 1974
Copan	MP	F	October 19, 1972
Cow Creek	FC	F	January 22, 1971
Crutch	FC	F	January 22, 1971
Dierks	MP	D	April 4, 1974
DeQueen	MP	F	May 12, 1972
El Dorado	MP	F	September 21, 1972
Flat Rock	FC	F	April 21, 1972
Gillham	MP	F	January 10, 1972
Hugo	MP	F	October 25, 1974
Kaw	MP	F	November 25, 1975
Lost Creek	FC	F	August 19, 1975
Lukfata	MP	D	June 26, 1975
Mud Creek	FC	F	July 21, 1975
Marion	FC	D	January 31, 1975
Optima	MP	F	September 9, 1974
Prosperity	MP	F	September 14, 1972
Shidler	MP	D	September 5, 1974
Skiatook	MP	F	March 10, 1972
Spring Creek	FC	D	April 26, 1971
Stillwater Creek	FC	D	March 19, 1971
Sycamore Dam	FC	D	March 21, 1974
Turtle Creek	FC	F	May 28, 1974
Waurika	MP	F	April 1, 1974

<sup>1</sup>MP-Multipurpose Reservoir

FC-Single purpose local protection flood control

WQC-Single purpose water quality control

<sup>2</sup>D-Draft

F-Final

<sup>3</sup>Arkansas-Red River Chloride Control Project

were progressing through these stages during the five year period of 1970 through 1975. The distribution by project and year is shown in Table XV. These show that most projects were in the AE&D stage and that 1972, 1974 and 1975 were years the most statements were filed. The trend toward higher numbers of statements in 1974 and 1975 agree with the Corps-wide trend shown in Figure 1.

The projects shown are categorized under two general types of Congressional Authority. The first type requires project specific Congressional Authorization and applies to the larger more complex multipurpose reservoir projects. The second type authority was delegated to the Corps by Congress under Section 205 of the 1948 Flood Control Act (49) and applies to projects where Federal costs are one million dollars or less. This category includes the smaller local protection flood control projects. These types of projects are expedited in the review process due to their simplicity and lower fiscal requirements. Generally, the projects indicated with FC in Table XIV fall into this category and are generally referred to as "205 Projects." These projects require the EIS just as the larger more complex projects.

The conflict between developmental pressures and environmental concern varies according to the location of the project within the District. In general there is more acceptance of developmental pressures in the western more arid areas which have sparse populations. The need for

TABLE XV  
PROJECT EIS FILINGS BY YEAR AND STAGE

Stage	1970	1971	1972	1973	1974	1975
General Investigation	Ark-Red Chloride Pt. I	Ark-Red Chloride Pt. II	Prosperity			
Advanced Engineering and Design		Spring Creek Stillwater Creek Crutcho Cow Creek	Birch Copan El Dorado Flat Rock Skiatook	Big Hill	Cedar Point Clayton Marion Shidler Turtle Creek Sycamore	Arcadia Big Pine Candy Lukfata Lost Creek Mud Creek
Construction			DeQueen Gillham		Dierks Hugo Optima Waurika	Kaw
TOTAL	1	5	8	1	10	7

water is widely recognized in these regions, particularly in southwestern Oklahoma where a long drought was experienced in the 1960's and where Waurika Lake, one of the projects listed in Table XIV, is now being constructed. In the southeastern regions, projects tend to become more controversial because water is relatively abundant and the natural free-flowing stream is prized by the naturalist. The Gillham Dam Case (41), a landmark court decision developed from this type of situation. Later, Lukfata which is also located in the same region, became the subject of environmental controversy. There certainly are exceptions to the generalization that location affects acceptability of a project as will be shown in the following paragraphs.

The project-by-project discussion will include a general description of the project and a history of its planning. Attention will center on the formulative processes which were conducted to decide what kind of project to build, where it should be built and how large it should be constructed in terms of the degree of flood protection or whether or not the maximum dependable yield should be developed.

As shown in Table XV, most of the projects are in the advanced engineering and design stage which means that a document known as a general design memorandum (GDM) or a detailed project report (DPR) was in the process of being written at the time the project formulation was being conducted. In general, the formulation process will precede

the submittal of the GDM or DPR by one to several years; however, the submittal data of the document is the most easily accessible information to use as a guide for determination of when the formulation was accomplished. The timing of the formulation is important because the purpose here is to compare the results of project formulation before and after NEPA; and for the projects which were formulated after NEPA, attempt to identify the results of NEPA impacts. The projects therefore will be discussed generally in chronological order, beginning with projects which were formulated prior to 1970 but were subjected to NEPA in the later stages of AE&D or in the construction stage.

The thirty-two projects can be divided into three general categories. The first category is those projects for which the AE&D studies were completed in the 1960's and construction began prior to the passage of NEPA in 1970. This group includes Dierks Lake, DeQueen Lake, Gillham Lake, Hugo Lake, Kaw Lake and Optima Lake. All of these projects are multipurpose reservoir projects; and since the study of the planning of all of these projects followed very similar patterns, the DeQueen project will be discussed in detail and the results generalized to the project group.

DeQueen Lake is a multipurpose reservoir built for flood control, water supply, water quality, recreation and fish and wildlife. The lake is located in southeastern Oklahoma on the Rolling Fork River and controls flows from

a 169 square mile drainage area. The AE&D studies, hereinafter referred to as the GDM investigations, began in May 1964 and the GDM was submitted March 1965. The project formulation in the GDM was very inadequate by today's standards, but was probably adequate under the rules that were in force at that time.

Under the rules applicable in the 1960's, initial planning studies for water resource projects were conducted on a basin-wide basis and a document called a survey report was ultimately sent to Congress for review and approval. The survey report was and is the decision-making document and contains documentation of the formulative processes used to arrive at a basin-wide plan. Once this document is approved, the recommended project became authorized and the next step was the GDM studies which were performed on a project-by-project basis and were accomplished in more detail than the survey report studies. Under this system, the decision to build a reservoir in a given basin is made in the survey report and the specific site selection studies were performed in the GDM. The formulation of DeQueen in the GDM stage as well as the other five projects fell into this pattern, that is, the formulation was merely site selection for a reservoir and engineering and cost considerations were the sole bases for decisions.

Today, the GDM stage studies are divided into Phase I and Phase II studies. The survey report method is still in use for the basin-wide studies, but the Phase I GDM studies



are survey report scope in detail and in the span of planning horizons. The idea is to reaffirm the survey report decision because usually a time span of possibly ten to fifteen years has passed since the survey report was developed and conditions change. The Phase II part of the GDM is essentially the same as the earlier complete GDM process. Discussion of the change in nature of a GDM study is necessary here because part of the differences in the scope of alternatives considered in the earlier studies mentioned above and the later Phase I GDM studies such as Arcadia and Cedar Point are due to the change in philosophy for GDM studies rather than a NEPA impact.

The formulation of the six projects consisted of site selection studies which was proper under the system in effect at that time, but it would not satisfy the rules established today because of the Phase I GDM requirement and the broadened scope of alternative review necessary for that phase of the study. NEPA would also have to be satisfied. Since these projects were under construction in 1970, the year of the passage of NEPA, the decision was made to write EIS's for these projects due to the retroactive effect given to NEPA. The basis for this retroactive effect was due partly to the court decision in the Gillham case which involved Gillham Lake, one of the six projects. Ironically, Gillham Lake was not drastically affected by the litigation insofar as changes in the project plan were concerned. However, intakes for the outlet works were modified to enable

withdrawals from several levels in the lake.

Two more of the six projects were affected in the post-NEPA period. The change was to add multi-level intakes to Dierks and DeQueen Dams. With the new intakes, water could be withdrawn from the lake at a level which would minimize pollution downstream. The adding of this flexibility in the design of outlet works is now standard and most outlet works are being designed in that manner.

Concern for the natural environment was one of the primary concerns expressed as NEPA became law. An examination of the project history of DeQueen (50) revealed that this same concern was expressed in 1965, five years prior to the passage of NEPA. The United State Government Fish and Wildlife Service indicated the aquatic environment would be significantly changed in the reach of the river inundated by the lake and suggested a portion of the lands be set aside for a wildlife management area to help mitigate the loss. The Corps considered their plan but declined to follow the recommendation because the plan was not economically justified. Economic justification is still in effect today and does limit the authority of the Corps to instigate such measures to help mitigate losses to the natural environment. In reviewing the other five reports the same question came up and was either dispensed as at DeQueen or the State Fish and Wildlife Service financed a wildlife management area on the shores of the lake. The main point to be made here is that the study of

the six projects revealed that concern for the impacts of a lake on the natural environment existed in the 1960's, but these concerns had no active part in the project formulation process.

One exception to these results was found in the Cow Creek Channel Improvement project. Cow Creek is a north bank tributary of the Arkansas River near Hutchinson, Kansas. Cow Creek floods on the average of twice a year and the local interests requested the Corps to develop a plan to solve the flood problem. In response to this request, the Corps designed a thirty-two mile channel improvement which would reduce the flooding to average one flood every four or five years. The GDM for this project was developed and submitted December 15, 1969, very close to the passage date of NEPA, January 1, 1970.

Prior to the submittal of this GDM, a public meeting was held in Hutchinson, Kansas and the project was presented to the people. Environmental concern had reached a high and a large contingent of environmentalists attended that meeting and indicated they did not want the natural channel straightened and wanted to maintain a natural setting. Channel improvement projects are widely considered very disruptive to natural ecosystems. Another group of persons wanted the project to protect them from floods.

Following the meeting, the Corps conducted new studies to mitigate the impact of the project on the environment. These studies were conducted prior to the passage of NEPA,

but the supplemental report resulting from these studies was not submitted until the last of March in 1970.

The proposed plan for mitigation was to set aside seven islands as areas for wildlife mitigation. The islands were formed by oxbows which were cut off by the improved channel. The idea was to route the low flows around the oxbows and maintain the natural aquatic environment in the original channel. Access to the public would be given with bridges and other facilities necessary for public use. The plan was to Federally finance the project as a research project. Basic data would be developed prior to construction, immediately after construction and ten years later to show the magnitude of the impact of such a project on the natural environment.

This plan never materialized because construction of the Cow Creek Channel Improvement was dependent upon the passing of a local bond issue. The bond issue failed. Although it cannot be proved conclusively, the reasons for failure were attributed to both the environmental concerns for the natural channel and some inequities in the financing structure developed by the local interests. Their tax-system was developed so the person who owned land on the edge of the flood plain which floods about once every fifty years paid the same rate per acre as the person with land on the channel bank which floods twice a year. The relative magnitude of these two forces which defeated the bond issue are unknown, but it appears that a concern for

the natural environment at least partially was responsible for stopping this project. The other point to be made here is that the Corps was actively trying to evaluate environmental impacts of their projects prior to the passing of NEPA. In spite of this effect, the Cow Creek Channel Improvement project never passed the design stage and the natural channel exists today.

The second category of projects are those which were formulated prior to 1970 and construction began after the passage of NEPA. One such project is Waurika Lake, which is located in southwestern Oklahoma. The multipurpose reservoir was built for flood control, irrigation, water supply, water quality, fish and wildlife and recreation. The dam controls flows from a 562 square mile drainage area and is located in an area where the need for water supply is very great. The GDM was submitted January 29, 1968 and construction began July, 1971. The GDM project formulation was very similar to those discussed in the previous category of projects, that is based on the narrow scope of the site selection process. The studies for the EIS were conducted in 1973 and 1974, and the project was reformulated taking into account the natural environment, economics and human life quality. A matrix for evaluation of all these impacts was developed by a multidisciplinary team. Numbers generated in the matrix were based on the judgment of the interdisciplinary team. A comparison of three alternatives is shown in Table XVI.

TABLE XVI  
EIS MATRIX ANALYSIS FOR WAURIKA LAKE

Planning Objective	Approved Lake	Corum Lake	Small Lakes
Natural Environment	129	89	172
Human Life Quality	295	256	193
Economics	<u>433</u>	<u>318</u>	<u>200</u>
TOTAL	857	663	565

This analysis showed the project selected in 1968 was considered the best in the new analysis, but that the small lakes alternative had more beneficial impacts on the natural environment. Nevertheless, the overall best plan was the one recommended in 1968. As a result, NEPA did not change the formulation of this project.

A second project, Big Hill Lake was formulated prior to submittal of the GDM which occurred June, 1964. Big Hill Lake is a multipurpose reservoir for flood control, water supply, fish and wildlife and recreation. After the passage of NEPA, the project was reformulated in 1973 for the EIS which was filed October 10, 1973. Construction for Big Hill Lake began October 10, 1973.

During the preparation of the EIS, a multidisciplinary team developed a matrix of alternatives and planning ob-

jectives. Comparison of the recommended plan and two alternatives are shown in Table XVII.

TABLE XVII  
EIS MATRIX ANALYSIS FOR BIG HILL LAKE

Planning Objective	Approved Lake	Water Supply Lake	Flood Plain Acquisition
Natural Environment	6	16	103
Human Life Quality	97	77	36
Economics	<u>177</u>	<u>96</u>	<u>28</u>
TOTAL	280	189	167

Again this matrix shows the plan developed in 1964 was best overall, but that the flood plain acquisition would do more to preserve the natural environment. Again NEPA did not change the formulation of this project.

The circumstances described for Waurika Lake and Big Hill Lake applied to a number of other multipurpose reservoir projects such as Birch, Skiatook, Copan and El Dorado Reservoirs. In each case the project recommended was found to be the best from an overall environmental viewpoint and no NEPA-induced changes occurred. Further discussion of these projects is not considered necessary.

Several small local protection projects for flood control were formulated prior to the passage of NEPA. These include the Flat Rock Creek Channel Improvement, a channel improvement on Mud Creek at Idabel, Oklahoma, a channel improvement project on Spring Creek at Springdale, Arkansas and a channel improvement project for Boomer Creek in Stillwater.

Several of these projects were formulated strictly on the basis of economics and engineering principles and did not change under the new analysis conducted for the EIS. These are the Mud Creek Project, the Boomer Creek Project and the Spring Creek Project. However, the Detailed Project Reports which contain the formulation and engineering data, provided for preservation of the environment. An example of this is shown in the Boomer Creek DPR (51), where the report states:

Trees, shrubs, and other vegetation will be preserved in their natural state....special care will be taken to assure that natural and scenic values be maintained over all portions of the project (51, p. 26).

Even though the formulation of these projects did not comply with NEPA, attempts to mitigate adverse effects on the environment were fairly standard in this pre-NEPA period.

Formulation of Flat Rock Creek, a channel improvement project located in Tulsa, Oklahoma resulted in the implementation of a NEPA concept. However, the formulation occurred during the pre-NEPA era.



The flood problem area on Flat Rock Creek, located in Tulsa, Oklahoma, was divided into three increments. Channel improvement could not be economically justified in the two downstream increments so it was agreed that the City of Tulsa would purchase the flood plain lands in the two downstream increments and the Corps would construct a channel improvement project in the upstream increment. The plan was approved and is operating today as planned. This is an example of implementation of a nonstructural alternative which preserves the natural environment and fulfills in part the intent of NEPA. However, this cannot be attributed to NEPA since it occurred prior to passage of the Act.

The El Dorado Lake Plan was formulated in 1968 and reanalyzed for the EIS in 1972. This lake, located east of Wichita, Kansas, was built for flood control, water supply, water quality control and recreation. No changes in the formulation were found in the EIS analysis, but thirty-seven archeological sites were found in the project area during the GDM studies in 1968. An archeological salvage operation began in 1969 and continued through 1975 to preserve the artifacts found in the project area. This is another example of an action taken prior to 1970 which shows that the Corps was implementing the NEPA intent prior to the effective date of NEPA.

The third category of projects are those which were formulated in the AE&D or GI studies after 1970, the year

of the passage of NEPA. Fourteen projects are in this category of which eight were not significantly affected by NEPA. These projects are Candy Lake, Clayton Lake, Crutch Creek Channel Improvement, Arcadia Lake, Cedar Point Lake, Prosperity Lake, Shider Lake and the Lost Creek Channel Improvement. Further discussion of these projects is not generally warranted since the effect of NEPA on the project formulation was not significant. This does not mean that the planning was deficient, but that environmental concerns were not of a sufficient magnitude to change the project formulation.

The proposal for a small dam on Sycamore Creek was in part the result of NEPA. Sycamore Creek was causing floods in Coffeyville, Kansas. In response to a request by the locals the Corps developed a plan for flood control on Sycamore Creek. Levees were not economically feasible, but channel improvement had a benefit-to-cost ratio (BCR) of 1.21. The Corps recommended a small detention dam in lieu of the levees because it offered a higher BCR at 1.49, as well as allowing the preservation of a green belt area through the city of Coffeyville. While the decision for this alternative was not solely the result of NEPA, considerations of preservation of environmental amenities in the urban areas of Coffeyville supplemented the economic forces which led to that decision.

The Turtle Creek channel improvement project at Yukon, Oklahoma was also affected by NEPA. Four archeological

sites were found in the project area, and the alignment for the improved channel was selected to avoid disturbing two of the sites that were considered of value. The other two sites had been almost destroyed by previous land uses in the area.

The Marion, Kansas local protection project consists of a levee plan to protect the town of Marion from the flooding of two streams, Mud Creek and the Cottonwood River. Formulation of this project was affected directly by NEPA considerations. Fourteen prehistoric sites were found in the project area during the GDM studies in 1972 and 1973. The costs of preserving the archeological sites were included as project costs in the plan formulation. As a result of these considerations, the proposed levee alignment was changed to minimize the overall project costs. The plan with the highest BCR was selected taking into account the cost of preserving the archeological sites. In this case the cost of preserving the environment was quantified and became an integral part of the plan formulation process.

The Arkansas-Red River Chloride Control project is unique as a water resource project. The plan was developed to control natural salt emissions at identified sources which are located generally in the western part of the District. The plan consists of a collection system for collection of the brine, a conveyance system to transfer the brine to a disposal site and a method of disposal.

Generally, total impoundment behind a dam was selected as a disposal system. Deep well injection was rejected as an alternative because of uncertainties involved with this type of disposal. These uncertainties involved possible contamination of surrounding ground waters. While the decision to use total impoundment as a disposal method has some environmental overtones, it was basically a technical decision and as such is not considered a NEPA impact.

The study has been divided into two parts. Part I involves the Red River Basin and Part II concerns the Arkansas River Basin. The Part I studies are nearing completion in the AE&D stage and no significant changes were found in the project formulation which could be attributed to NEPA.

The Part II AE&D studies are beginning for the Arkansas River Basin and appear to be involving some environmental concerns. The primary issue has to do with the formation of selenite crystals near the Great Salt Plains Reservoir. All of the alternatives under consideration are perceived by many as affecting the selenite crystals. Little is known about how these crystals form, and the Corps is planning studies to help understand the crystal formation process and develop measures to avoid the destruction of this unique process. It is too early to speculate on what impact NEPA may have on this project, but it appears the NEPA policy will have some definite impacts on the formulation of this project.

The formulation of two projects have been significantly affected by NEPA. These projects are Lukfata Lake and Big Pine Lake. These projects, their formulation and the effect of NEPA on their formulation is discussed in the following paragraphs.

Lukfata Lake is planned as a multipurpose reservoir for flood control, water supply and recreation, including fish and wildlife. It is proposed to be on Glover Creek, the last uncontrolled major tributary of the Little River in southeastern Oklahoma. This fact made Lukfata the most environmentally controversial project in the Tulsa District since the Gillham Dam case.

The first step in formulating Lukfata Lake was to develop a large number of alternatives. These alternatives were screened to ten alternatives which are listed below.

- (1) Multipurpose lake at authorized site (mile 17.3)
- (2) Multipurpose lake at upper site (mile 24.5)
- (3) Flood control lake at upper site (mile 24.5)
- (4) Tributary flood control lakes
- (5) Tributary water supply lakes
- (6) Levees
- (7) Fee purchase of flood plain
- (8) Flood plain management
- (9) National recreation area
- (10) No action

The impacts of each of these alternatives on the natural environmental quality, human life quality, and

national and regional economics were evaluated. This evaluation was accomplished by a multidisciplinary team composed of the disciplines of biology, economics, sociology, landscape architecture, archeology, law, and engineering.

Four major factors were considered in the evaluation of the environmental effects of the alternatives on the natural environment. These factors were: (1) unique, rare, endangered, or unusually important species, (2) plant and animal habitat, (3) ecosystem diversity and stability and (4) ecosystem productivity. The team concluded, an impoundment on Glover Creek or any of its tributaries would have a negative effect on plant and animal habitat and ecosystem diversity and stability. Nonstructural alternatives would affect the natural habitat and ecosystem to a lesser extent.

A number of factors were considered in the evaluation of impacts of the ten alternatives on human life quality. These factors included recreational opportunities, anxiety factors such as pollution, flooding, water supply, nuisance and vandalism, aesthetics, historical and cultural resources, life-style and community cohesion. The biggest impact was found to be on archeological sites. Community cohesion would not be disrupted significantly because only two households would have to be relocated. Nonstructural alternatives in general had less impact on the human life quality aspects.

Economic impact evaluation included the study of two major factors: project efficiency and gross local and regional output. Excess benefits over costs was the major indicator of these factors. The upstream alternative, that is alternative number two ranked first, follows closely by alternative number one. Alternatives three and five were economically justified and the remaining alternatives were not.

The multidisciplinary team took into account natural environment, human life quality and economics and concluded there were no significant differences in most of the alternatives considered.

Lukfata Lake first received wide public attention in the 1972 public meetings at Oklahoma City and Broken Bow, Oklahoma. At that time, the recommended plan was a multiple purpose lake at the mile 17.3 site with full development of the conservation storage. While local interests were much in support of this project, environmental groups strongly opposed the damming of what they feel is the last major free flowing stream in the Quachita Mountains. A multiple purpose lake at the mile 24.5 site was one of the alternatives considered in preparing for the 1972 public meetings. At that time, however, it was not believed to be the best alternative for several reasons. One reason was that engineering data for the upper damsite were very preliminary, and it appeared that the upper project would cost more than the one at the lower site. A second reason was

that since maximum site development was being recommended, the smaller water supply yield at the upper site was not considered desirable. A third reason was that the project at the lower site would provide greater flood protection.

Following the 1972 public meetings, the Tulsa District began to reevaluate its position. Interest in the upper damsite began to grow, not only from within the Corps, but also from outside the Corps. More detailed engineering data were obtained for the upper damsite so project costs could be more accurately determined. Several new alternatives were considered because of suggestions made at the public meetings. Water supply needs were restudied, and it was determined that initial maximum development of the conservation storage would not be necessary. Because of increasing awareness of the value of Glover Creek as a recreational resource, the Tulsa District contracted with the Bureau of Outdoor Recreation to study the recreation potential of lower Glover Creek.

Following the 1974 workshops, additional work was done towards development of a plan to provide low-flow releases for fishing and boating on Glover Creek along with a plan to purchase and develop a land corridor to assure public access to the stream and prevent undesirable development. In April, 1975, the Glover River Organization issued a report urging immediate development of a project at the upper site in the spirit of compromise, recognizing that some reduction in flood protection would be better than



nothing at all. The Governor of Oklahoma endorsed the project at the upper site and urged that construction proceed immediately. Oklahoma's two Senators and House Speaker Carl Albert made public their support of the upper site.

A third public meeting was held in July, 1975, in Broken Bow, presenting a multiple purpose lake at stream mile 24.5 and a downstream recreation corridor (alternative 2) as the best plan for Glover Creek. The registered attendance was 354. Again, local interests in south McCurtain County were much in support of the project, citing the urgent need for additional flood protection. A new group from north McCurtain County, the Upper Glover River Association, voiced strong opposition to the project because of its effects on privately owned land. Most of the environmental groups also expressed strong opposition to the project.

It was decided that the selection of the best plan for Glover Creek could not be made solely on the basis of mechanical and subjective comparisons of impacts which showed little difference among most of the alternatives. Rather, it seemed more appropriate to find a plan that would strike the best balance between efficiently satisfying the water resources needs and preserving the environmental integrity of Glover Creek.

A multiple purpose lake at mile 24.5 on Glover Creek (Alternative 2) would fit this category and was recommended as the proposed plan of improvement. The project would meet

the known water supply and recreation needs of the area and would provide a high degree of flood protection although some protection would be lost by moving from the downstream damsite. Glover Creek below the dam would be preserved by acquisition of the proposed land corridor.

This is an example of utilizing public inputs to select the best water resource plan. After weighing and balancing the factors of the natural environment, human life quality and economics, the multidisciplinary team found no significant difference in the alternatives. None of the alternatives were highly objectionable from a total environment point of view. The balancing process produced a compromise solution which preserved seventeen miles of natural stream, yet satisfied the needs for water supply, flood control and recreation.

The project formulation of Big Pine Lake was also affected by NEPA. Big Pine Lake is also planned as a multi-purpose reservoir for flood control, water supply, recreation, and fish and wildlife. It will control a drainage area of 87 square miles in the Big Pine Creek Basin, which is a right bank tributary of the Red River in northeastern Texas.

Alternatives were evaluated by a multidisciplinary team just as was done for Lukfata Lake. A screening process was used to narrow the alternatives to ten. These alternatives would provide at least a partial solution to the water resource needs of the area. No action, structur-

al and nonstructural alternatives were evaluated with some of the alternatives being beyond the authority of the Corps to implement.

A matrix analysis was developed for ten of the alternatives. Of the ten, four mainstream dams showed the most promise for satisfying the water resource needs of the area. The results of the matrix analysis for the four sites are shown in Table XVIII.

TABLE XVIII  
EIS MATRIX ANALYSIS FOR BIG PINE LAKE

	Site B	Site A	Site D	Site F
Planning Objective	R.M. 11.5	R.M. 13.2	R.M. 16.5	R.M. 20.4
Natural Environment	-292	-283	-179	-137
Human Life Quality	122	119	141	134
Economics	<u>338</u>	<u>288</u>	<u>275</u>	<u>222</u>
TOTAL	168	124	237	219

Site D was selected. The summary of the matrix analysis shows that some trade-offs were involved in the plan selection process and that the plan that would be economically most efficient was discarded in favor of a plan which

ranked highest in human life quality and had less adverse impact on the natural environment.

The selected alternative would require some clearing and snagging in the reach below the dam to maintain a channel capacity. However, the channel clearing would be minimized to maintain the unique wetlands below the dam. Flood easements would be acquired so flood flows could be used to periodically recharge the wetlands and maintain the ecological balance. In addition, selection of this plan minimized loss to community cohesion because fewer people would have to be relocated as the plan is implemented.

In this case, the upstream site was selected to avoid total disruption of the unique wetlands and to minimize adverse social impacts. It is an example of the type of plan formulation envisioned by those who contributed to NEPA as it became law.

In summary, a number of Tulsa District projects which have been formulated since the passing of NEPA have been modified in response to NEPA. These are summarized in Table XIX.

The modifications in Table XIX provide some proof that "appropriate consideration" as stated in NEPA is being given to environmental amenities in the water resource planning process.

Examination of the project histories of the thirty-two projects for which EIS's were written showed little change

in the projects which were under construction at the time NEPA passed. However, projects formulated during 1974 and 1975 seem to be modified to a greater extent.

TABLE XIX  
SUMMARY OF TULSA DISTRICT PROJECTS  
AFFECTED BY NEPA

Project	Modification
Big Pine	Moved damsite upstream to preserve unique wetlands and minimize social impacts
DeQueen	Installed multilevel intakes for outlet works to maintain better water quality control
Dierks	Installed multilevel intakes for outlet works to maintain better water quality control
Gillham	Installed multilevel intakes for outlet works to maintain better water quality control
Lukfata	Moved damsite upstream to preserve natural stream for recreation corridor
Marion Local Protection	Changed levee alignment to minimize impact on archeological sites
Turtle Creek Channel Improvement	Selected channel alignment to avoid destruction of archeological sites

The project histories also show that some measures taken by the Corps in the pre-NEPA period could be considered a response to NEPA if the law had been in force at that time. Examples are the proposed design modification for the Cow Creek Channel Improvement Project. Also, the Flat Rock Creek Project was designed to operate in conjunction with flood plain acquisition, a non-structural alternative which is consistent with the NEPA philosophy. In addition, fish and wildlife coordination usually resulted in consideration being given to mitigation measures to offset adverse fish and wildlife impacts and reports evinced a philosophy that environmental disruptions by construction activities should be kept to a minimum.

Based on the response of the Tulsa District to NEPA, it appears that pre-NEPA decisions reflect some concern for environmental amenities, and that the influence of NEPA on project formulation did not really become significant until the years of 1974 and 1975.

## CHAPTER VII

### DISCUSSION

The national environmental policy promulgated in Section 101 of NEPA is a very broad statement. However, the goals also set forth in Section 101 are somewhat more specific. These goals are preservation of historic, cultural and natural aspects of our national heritage, attainment of a wide use of the environment without degradation, achievement of a balance between population and resource use, assurance of healthful, productive and esthetically and pleasing surroundings, enhancement of the quality of renewable resources and maximization of recycling of depletable resources. This national environmental policy could have been just a statement of policy; however, time and again, in the legislative history of NEPA it was emphasized that there should be some action forcing provision for enforcement of the policy.

Enforcement of the policy is difficult because no standards are provided to measure achievement of the goals outlined in the policy. For instance, how much enhancement of quality in renewable resources satisfies that particular goal? When does one attain wide use of the environment without degradation? In other words, what constitutes de-

gradation when there must be a balance between population and resource use?

Yet, the goals are preceded by the requirement that the Federal government shall use all practical means and measures, consistent with essential considerations of national policy to improve Federal programs so the nation may achieve these goals. This statement plus others in NEPA give rise to a duty for all Federal agencies to implement the policy although it is somewhat ill defined per se.

The courts have interpreted the policy by linking the procedural aspects of Section 102 with the policy provisions of Section 101. The linking phrase in Section 102(2) B requires agencies to identify and develop methods and procedures which will insure unquantifiable environmental amenities and values may be given appropriate consideration in decision-making. Standing alone this language is discretionary in nature. By linking this language to Section 101 and interpreting the law in the light of its legislative history, the courts have required that full consideration must be given to environmental impacts. The courts go on to recognize that conflicts will arise between environmental concerns and economic and technical aspects so "full consideration" means there must be a balancing process between these two often conflicting facets of the decision-making process. This means that NEPA is something more than a full disclosure law; however, in the legisla-



tive history, NEPA is portrayed something less than a preservationist's law. While this does not provide an explicit standard, it does help define what the law requires.

Further definition of NEPA requirements is attained by defining the word "environment." The word "environment" is presented in NEPA as man's environment, "the natural environment" and "the environment." Legislative and judicial interpretation has extended the meaning to "the total environment," that is made up of man's natural, physical and social environment. Emphasis has been given to the totality of the environment and interactions among the many facets of the environment.

An exact measure of a Federal agency's compliance with the policy provisions is impossible. There are several reasons for this impossibility. First, the goals are not well defined and are somewhat subjective and intangible. The court decisions and administrative regulations help narrow the band of possible interpretations, but no precise meaning can be achieved. Second, it is hard to trace the exact source or reason for a decision, made for a "major Federal action," much less define who the decision maker in the Federal government is. However, the results of an examination and analysis of changes in these "major Federal actions" after NEPA became law can infer whether NEPA is or is not attaining what Congress intended it to do.

The approach for this study was to select an entity in

the mass of Federal agencies and use a case study approach to determine if "full consideration" of environmental amenities has in fact been achieved. Tulsa District, Corps of Engineers was selected for this case study.

A NEPA history was reconstructed for Tulsa District by examining the history of projects for which an EIS was written. The study centered on the project formulation of each of these projects and NEPA influences were identified and studied. This study went beyond the EIS itself and included interviews, examination of project documents and other available records.

The results showed that some "consideration" of environmental amenities occurred in the pre-NEPA period. The prime example of this is the Cow Creek Channel Improvement Project where fish and wildlife mitigation measures were very actively pursued. A check of interagency coordination for other projects formulated in the 1960's revealed some consideration of fish and wildlife measures, but normally these were add-ons, after the project had been formulated and were not significantly considered in the formulation process. Project formulation of the 1960's was based primarily on engineering and technical considerations.

Immediately after the passage of NEPA, the EIS process was applied to a backlog of projects. The Gillham Case arose and that project as well as two other projects had added to them the multilevel intakes for outlet works to enhance water quality releases. It is now standard pro-

cedure to design these multilevel intakes, but research indicates that NEPA primarily through the Gillham Case accelerated their use for Gillham Lake, DeQueen Lake and Dierks Lake.

The remainder of the backlog projects remained essentially unchanged when reformulated under NEPA. However, the data indicates that "consideration" was given to environmental concerns. Impacts on the natural environment was usually found to be small if not adverse but were always overcome by beneficial social and economic impacts.

The third generation of projects, that is those that were formulated in 1974 and 1975, appear to reflect the full impact of NEPA. The changes to these projects were discussed fully in Chapter VI. However, one item is worthy of note here. NEPA requires an interdisciplinary approach, interagency coordination and public participation. There is evidence that all three of these elements have affected the formulation of the projects included in the last generation EIS's.

Examination of Corps-wide trends showed that the rate of EIS generation is increasing while the rate of project modifications, project stoppages and project delays are declining. The decline in the NEPA induced changes can be attributed to better planning or it can be caused by a general decline in the public's concern for the environment.

The broad scope of the environment is carried through to Section 102 where there exists the requirement for a

systematic interdisciplinary approach to environmental problems. This apparently requires a broad approach be taken when making decisions concerning the environment.

General compliance with the interdisciplinary aspect of these requirements by the Corps appears adequate when one reads the EIS's that are generated and studies the staffing which has been developed to write the EIS. However, the staffing as well as the content of the statements indicate a heavy weight is being given to the natural environment but social and cultural aspects are given secondary consideration. It would seem a balanced approach to consideration of the total environment would require equal weight be given to all facets being considered.

Social and cultural aspects of the environment do not seem to be given appropriate coverage. This is suggested by the fact that only two percent of the staff writing EIS's have a background in sociology or social science. This is further suggested by looking at the percentages of EIS's which contained adequate discussion of social impacts, habits and customs. Discussion of the social and cultural habits in the environmental setting without the project was adequate in only forty-seven percent of the statements examined. The percentage per se does not have much meaning because it is somewhat judgmental, but it does show that adequate discussion of sociological aspects was found significantly less often than the other required topics. In addition to that inadequacy, EIS discussion of social im-

pacts was found to be lacking.

Cultural and archeological aspects followed a similar pattern as social impacts in both staffing statistics and in coverage in the EIS. The evolution of the EIS section requiring a discussion of irrevocable commitment of resources showed that only twelve percent of the statements reviewed discussed archeological sites lost. This fact coupled with the fact that less than one percent of the staff has a background in archeology infers that more emphasis should be placed on this discipline and the role it plays in the EIS process.

Water quality data was shown in most of the statements examined, but usually no water quality standards were shown for comparison. Often, the data shown did not relate to potential water quality problems, which suggests that the writer either did not identify the potential problem areas or inserted available data into the statement without regard to its relevancy to the problems. These indications plus a lack of personnel with bioenvironmental engineering backgrounds on the staffing suggests a lack of technical expertise being applied to this part of the EIS.

In a generic sense, the EIS evaluation showed procedural compliance to be less than perfect and probably had not substantially improved since the study by Ortolano and Hill (17). This evaluation showed further that a reorganization of EIS content could result in more efficient preparation of the EIS.

The proposed reorganization would consist of combining the content of three sections presently required for the EIS into the alternatives section. These three sections are the adverse impacts section, the irreversible commitment section and the section requiring a showing of the relationship of short-term uses of the environment and long-term productivity. The reorganization would increase the efficiency of EIS preparation, reduce duplication of effort and place these important aspects in the alternatives section where "full consideration" can be given them in the decision-making process.

Andrews (19) in his 1972 dissertation stated that the response of most agencies to NEPA is incremental. By this he meant that the agencies were moving from no compliance to partial compliance required by NEPA. The results in this study show that the same is true, except that the incremental change is from partial compliance in the pre-NEPA period to what may be full compliance. Whether or not it is full compliance will be left for determination of future generations.

## CHAPTER VIII

### CONCLUSIONS

The results of this investigation supports the following conclusions:

(1) Congress intended the National Environmental Policy of 1969 to be implemented by all Federal agencies by giving full consideration of environmental amenities.

(2) Full consideration as stated above requires that the agencies balance environmental impacts with economic and technological effects.

(3) Enforcement of the policy is achieved by the EIS process as established in Section 102 of NEPA. This is the "action-forcing" provision of NEPA.

(4) Corps-wide data for EIS preparation and NEPA induced effects on Corps projects show that the rate of EIS preparation in the Corps is increasing, but the rate of project modifications, stoppages and delays are decreasing. The reducing rate of NEPA induced effects could be attributed to a decline in environmental concerns or better environmental planning.

(5) A detailed study of project planning in the Tulsa District suggests environmental planning has improved due to NEPA.

(6) The study of a sample of EIS's from seventeen Corps Districts indicates water quality, air quality, sociological, archeological and historical concerns are not given sufficient consideration and documentation in the EIS process.

(7) The organization of the EIS should be changed. Discussion of the adverse impacts, irreversible commitments and the relationship between short-term uses of the environment and long-term productivity should be included in the alternatives section. This would increase EIS preparation efficiency, avoid duplication of effort and place these important aspects in the alternatives section where "full consideration" can be given them.



## CHAPTER IX

### SUGGESTIONS FOR FUTURE STUDY

The broad scope and applicability of NEPA to all Federal agencies provides a fertile field for further study. A few suggested areas of study are listed below.

- (1) A study of the role of the Council on Environmental Quality
- (2) A comparative study of agency compliance with the National Environmental Policy Act of 1969
- (3) Economic costs of delays caused by environmental litigation
- (4) Improved methods for a systematic interdisciplinary approach to environmental planning

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APPENDIX A

THE NATIONAL ENVIRONMENTAL POLICY

ACT OF 1969

Public Law 91-190 (42 U.S.C. 4321-4347)

An Act to establish a national policy for the environment, to provide for the establishment of a Council on Environmental Quality, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Environmental Policy Act of 1969."

Purpose

Sec. 2. The purposes of this Act are: To declare a national 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 biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

Title IDeclaration of National Environmental Policy

Sec. 101. (a) The Congress, recognizing the profound impact of man's activity on the interrelations of all components of the natural environment, particularly the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances and recognizing further the critical importance of restoring and maintaining environmental quality to the overall welfare and development of man, declares that it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.

(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may--



(1) Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(2) Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;

(3) Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

(4) Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;

(5) Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and

(6) Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

Sec. 102. The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the

policies set forth in this Act, and (2) all agencies of the Federal Government shall--

(A) Utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment;

(B) Identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations;

(C) Include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on--

(i) The environmental impact of the proposed action,

(ii) Any adverse environmental effect which cannot be avoided should the proposal be implemented,

(iii) Alternatives to the proposed action,

(iv) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) Any irreversible and irretrievable

commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title V, United States Code, and shall accompany the proposal through the existing agency review processes;

(D) Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;

(E) Recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(F) Make available to States, counties, municipalities, institutions, and individuals, advice and informa-

tion useful in restoring, maintaining, and enhancing the quality of the environment;

(G) Initiate and utilize ecological information in the planning and development of resource-oriented projects; and

(H) Assist the Council on Environmental Quality established by title II of this Act.

Sec. 103. All agencies of the Federal Government shall review their present statutory authority, administrative regulations, and current policies and procedures for the purpose of determining whether there are any deficiencies or inconsistencies therein which prohibit full compliance with the purposes and provisions of this Act and shall propose to the President not later than July 1, 1971, such measures as may be necessary to bring their authority and policies into conformity with the intent, purposes, and procedures set forth in this Act.

Sec. 104. Nothing in Section 102 or 103 shall in any way affect the specific statutory obligations of any Federal agency (1) to comply with criteria or standards of environmental quality, (2) to coordinate or consult with any other Federal or State agency, or (3) to act, or refrain from acting contingent upon the recommendations or certification of any other Federal or State agency.

Sec. 105. The policies and goals set forth in this Act are supplementary to those set forth in existing authorizations of Federal agencies.

Title IICouncil on Environmental Quality

Sec. 201. The President shall transmit to the Congress annually beginning July 1, 1970, an Environmental Quality Report (hereinafter referred to as the "report") which shall set forth (1) the status and condition of the major natural, manmade, or altered environmental classes of the Nation, including, but not limited to, the air, the aquatic, including marine, estuarine, and fresh water, and the terrestrial environment, including, but not limited to, the forest, dryland, wetland, range, urban, suburban and rural environment; (2) current and foreseeable trends in the quality, management and utilization of such environments and the effects of those trends on the social, economic, and other requirements of the Nation; (3) the adequacy of available natural resources for fulfilling human and economic requirements of the Nation in the light of expected population pressures; (4) a review of the programs and activities (including regulatory activities) of the Federal Government, the State and local governments, and nongovernmental entities or individuals with particular reference to their effect on the environment and on the conservation, development and utilization of natural resources; and (5) a program for remedying the deficiencies of existing programs and activities, together with recommendations for legislation.

Sec. 202. There is created in the Executive Office of the President a Council on Environmental Quality (hereinafter referred to as the "Council"). The Council shall be composed of three members who shall be appointed by the President to serve at his pleasure, by and with the advice and consent of the Senate. The President shall designate one of the members of the Council to serve as Chairman. Each member shall be a person who, as a result of his training, experience, and attainments, is exceptionally well qualified to analyze and interpret environmental trends and information of all kinds; to appraise programs and activities of the Federal Government in the light of the policy set forth in title I of this Act; to be conscious of and responsive to the scientific, economic, social, esthetic, and cultural needs and interests of the Nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment.

Sec. 203. The Council may employ such officers and employees as may be necessary to carry out its functions under this Act. In addition, the Council may employ and fix the compensation of such experts and consultants as may be necessary for the carrying out of its functions under this Act, in accordance with section 3109 of title V, United States Code (but without regard to the last sentence thereof).

Sec. 204. It shall be the duty and function of the

Council--

(1) To assist and advise the President in the preparation of the Environmental Quality Report required by section 201;

(2) To gather timely and authoritative information concerning the conditions and trends in the quality of the environment both current and prospective, to analyze and interpret such information for the purpose of determining whether such conditions and trends are interfering, or are likely to interfere, with the achievement of the policy set forth in title I of this Act, and to compile and submit to the President studies relating to such conditions and trends;

(3) To review and appraise the various programs and activities of the Federal Government in the light of the policy set forth in title I of this Act for the purpose of determining the extent to which such programs and activities are contributing to the achievement of such policy, and to make recommendations to the President with respect thereto;

(4) 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;

(5) To conduct investigations, studies, surveys, research, and analyses relating to ecological systems and

environmental quality;

(6) To document and define changes in the natural environment, including the plant and animal systems, and to accumulate necessary data and other information for a continuing analysis of these changes or trends and an interpretation of their underlying causes;

(7) To report at least once each year to the President on the state and condition of the environment; and

(8) To make and furnish such studies, reports thereon, and recommendations with respect to matters of policy and legislation as the President may request.

Sec. 205. In exercising its powers, functions, and duties under this Act, the Council shall--

(1) Consult with the Citizens' Advisory Committee on Environmental Quality established by Executive Order No. 11472, dated May 29, 1969, and with such representatives of science, industry, agriculture, labor, conservation organizations, State and local governments and other groups, as it deems advisable; and

(2) Utilize, to the fullest extent possible, the services, facilities and information (including statistical information) of public and private agencies and organizations, and individuals, in order that duplication of effort and expense may be avoided, thus assuring that the Council's activities will not unnecessarily overlap or conflict with similar activities authorized by law and performed by



established agencies.

Sec. 206. Members of the Council shall serve full time and the Chairman of the Council shall be compensated at the rate provided for Level II of the Executive Schedule Pay Rates (5 U.S.C. 5313). The other members of the Council shall be compensated at the rate provided for Level IV of the Executive Schedule Pay Rates (5 U.S.C. 5313).

Sec. 207. There are authorized to be appropriated to carry out the provisions of this Act not to exceed \$300,000 for fiscal year 1970, \$700,000 for fiscal year 1971, and \$1 million for each fiscal year thereafter.

Approved January 1, 1970.

APPENDIX B

AMENDMENT INTENDED TO BE PROPOSED

BY MR. JACKSON TO S. 1075

A BILL TO authorize the Secretary of the Interior to conduct investigations, studies, surveys and research relating to the Nation's ecological systems, natural resources, and environmental quality, and to establish a Council on Environmental Quality.

"SHORT TITLE

This Act may be cited as the "National Environmental Policy Act of 1969."

Purpose

Sec. 2. The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his natural environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Board of Environmental Quality Advisors.

Title IDeclaration of National Environmental Policy

Sec. 101. (a) The Congress, recognizing that man depends on his biological and physical surroundings for food, shelter, and other needs, and for cultural enrichment as well; and recognizing further the profound influences of population growth, high-density urbanization, industrial expansion, resource exploitation, and new and expanding technological advances on our physical and biological surroundings, and on the quality of life available to the American people; hereby declares that it is the continuing policy and responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs and resources to the end that the Nation may--

(1) Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(2) Assure for all Americans safe, healthful, productive and aesthetically and culturally pleasing surroundings;

(3) Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other unintended, unanticipated, and undesirable consequences;

(4) Preserve important historic, cultural and natural aspects of our national heritage, and maintain, wherever possible, diversity and variety;

(5) Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and

(6) Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(b) The Congress recognizes that each person has a fundamental and inalienable right to a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

Sec. 102. The Congress authorizes and directs that the policies, regulations and public laws of the United States be interpreted and administered in accordance with the policies set forth in this Act, and that all agencies of the Federal Government--

(1) Utilize to the fullest extent possible a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision-making which may have an impact on man's environment;

(2) Identify and develop methods and procedures which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical con-

siderations;

(3) Include in every recommendation or report on proposals for legislation or other significant Federal actions affecting the quality of the human environment, a finding by the responsible official that--

(i) The environmental impact of the proposed action has been studied and considered;

(ii) Any adverse environmental effects which cannot be avoided by following reasonable alternatives are justified by stated considerations of national policy;

(iii) Local short-term uses of man's environment are consistent with maintaining and enhancing long-term productivity; and

(iv) Any irreversible and irretrievable commitments of resources are warranted.

(4) Study, develop and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of land, water or air;

(5) Recognize the worldwide and long-range character of environmental problems and lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment;

(6) Review present statutory authority, administrative regulations and current policies and pro-

cedures for conformity to the purposes and provisions of this Act and propose to the President and to the Congress within one year after the date of enactment such measures as may be necessary to make their authority consistent with this Act;

Sec. 103. The policies and goals set forth in this Act are amendatory and supplementary to, but shall not be considered to repeal the existing mandates and authorizations of Federal agencies.

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VITA

Donald Adolph Flasch  
Candidate for the Degree of  
Doctor of Philosophy

Thesis: AN EVALUATION OF THE NATIONAL ENVIRONMENTAL POLICY  
ACT OF 1969 AND ITS IMPLEMENTATION

Major Field: Civil Engineering

Biographical:

Personal Data: Born September 10, 1935, in Oklahoma City, Oklahoma, the son of Mr. and Mrs. J. R. Flasch.

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Professional Experience: Hydraulic Engineer at Tulsa District Corps of Engineers June 1962 through September 1970; Chief, Arkansas River Hydrology Section, Tulsa District, Corps of Engineers, September 1970 through September 1973 and from January through July 1974; Project Engineer in Planning Branch, Tulsa District, Corps of Engineers, September through December 1975; Chief of General Planning, Tulsa District Corps of Engineers, January, 1976 to present.

Membership in Professional Societies: Tulsa Society of Engineers, American Society of Agricultural

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Membership in Honorary Societies: Sigma Tau, Alpha  
Zeta, Blue Key, Chi Epsilon, Who's Who in  
American Colleges and Universities.