TECHNICAL REPORT M-74-10

BASELINE ELEMENTS AND INFORMATION SOURCES FOR ENVIRONMENTAL QUALITY MANAGEMENT OF MILITARY INSTALLATIONS

by

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Task 006
The National Environmental Protection Act of 1969 requires that the Army conduct its activities without degrading the environmental quality of the surrounding areas. The immediate goals of environmental quality management as established by the Act could not be attained by Army facilities using available technology. For the Army's future mission to be compatible with the Nation's environmental quality standards, the Office, Chief of Engineers, U. S. Army, ...
20. ABSTRACT (Continued).

established a research program on 1 July 1974 entitled "Environmental Quality for Construction and Operation of Military Facilities" with the primary responsibility for conducting the program assigned to the Construction Engineering Research Laboratory (CERL) at Champaign, Illinois. CERL has developed...

As part of CERL's response to this assignment, an automated system was structured to identify impacts of Army activities on the environment. This system, called the Environmental Impact Computer System (EICS), requires that the user have some knowledge of Army activities and the environment to be able to collect required input data and to interpret the output of the EICS. CERL requested that the U.S. Army Engineer Waterways Experiment Station compile a list of environmental baseline elements and assemble a catalog of environmental information sources to aid personnel using the EICS as well as to provide background material for those personnel charged with preparation of Environmental Impact Assessments and Statements.

The information sources are available via an information system structured for this study. Access to this system can be obtained by contacting CERL.
PREFACE

Personnel of the Environmental Simulation Branch (ESB), Environmental Systems Division (ESD), Mobility and Environmental Systems Laboratory (MESL), U. S. Army Engineer Waterways Experiment Station (WES), conducted the study reported herein from April to October 1975. The work supported DA Project 4A762720A896, "Environmental Quality for Construction and Operation of Military Facilities," DAW 49006, "Methodology for Characterization of Military Installations Environmental Baselines," under the sponsorship of the Directorate of Military Construction, Office, Chief of Engineers (OCE), U. S. Army. As requested, this study supports the requirement to provide sources for obtaining quantitative data needed to delineate current pollution potential and environmental characteristics of Army installations and facilities (QCR 1.03.006). The OCE Technical Monitor was Mr. Vincent J. Gottschalk.

The study was under the direct supervision of Mr. J. K. Stoll, Chief, ESB, and under the general supervision of Messrs. W. G. Shockley, Chief, MESL, and B. O. Benn, Chief, ESD. Mr. M. P. Keown, ESB, compiled the list of environmental baseline elements. Messrs. Keown, E. A. Dardeau, Jr., and T. J. Allen, ESB, and Ms. M. L. Doiron, MESL, were responsible for locating, examining, and classifying the information sources. Dr. V. E. LaGarde and Mr. M. R. Weathersby, ESB, structured the computerized information system, and Messrs. Keown and Weathersby prepared the report.

COL G. H. Hilt, CE, and COL J. L. Cannon, CE, were Directors of WES during the study and preparation of the report. Mr. F. R. Brown was Technical Director.
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### TABLE 1

| Appendix A: LISTING OF ENVIRONMENTAL IMPACT STATEMENTS PREPARED FOR MILITARY INSTALLATIONS |
| APPENDIX B: SOURCES OF DRAFT AND FINAL ENVIRONMENTAL IMPACT ASSESSMENTS AND ENVIRONMENTAL IMPACT STATEMENTS |
| APPENDIX C: LISTING OF ENVIRONMENTAL BASELINE ELEMENTS |

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BASELINE ELEMENTS AND INFORMATION SOURCES FOR ENVIRONMENTAL QUALITY MANAGEMENT OF MILITARY INSTALLATIONS

PART I: INTRODUCTION

Background

1. The era of "environmental awareness" has added a new dimension to the Army's overall mission plan. In an effort to meet the goals set forth in the National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190), military personnel must plan Army activities not only to meet mission requirements but also to ensure that the activities are not in violation of environmental protection laws and standards. NEPA became effective on 1 June 1970 in response to a national realization that mankind's technology must not advance at the expense of the natural environment. The act is divided into two basic parts: Title I and Title II. Title I sets forth the national policy on restoration and protection of environmental quality. Title II establishes the Council on Environmental Quality (CEQ). This council develops and recommends to the President national policies that promote environmental quality, performs a continuing analysis of changes or trends in the national environment, and assists the President in the preparation of the annual environmental quality report to Congress.

2. The technology available to environmental quality managers at Army installations at the time when NEPA became effective was not adequate to meet the goals specified by NEPA. For the Army's future mission to be compatible with the Nation's environmental quality standards, the Office, Chief of Engineers, established a research program on 1 July 1974 entitled "Environmental Quality for Construction and Operation of Military Facilities," with the primary responsibility for conducting the program assigned to the Construction Engineering Research Laboratory (CERL) at Champaign, Illinois. The major objectives of this program are to explore and develop technology that will enable military
facilities to conform to the national goals for environmental quality. The results of this research effort will assist Army personnel at all levels in responding to NEPA and corollary legislation as well as aid the Army in meeting the objectives of the Army's Environmental Program.

3. An important consequence of NEPA is that the Army must integrate the preparation of Environmental Impact Assessments (EIA's) and Environmental Impact Statements (EIS's) into current and planned activities. The assessments and statements differ in purpose and use. An EIA is the basis for a preliminary assessment of the impact of a military activity on the environment and is designed to provide information adequate for judging whether an EIS should be prepared. If after review of the EIA, it becomes apparent that the proposed or existing military activity will have a significant effect on the quality of the environment, or the activity is or will be environmentally controversial, then an EIS must be prepared. An EIS is a much more detailed analysis of the environmental consequences of a military activity than an EIA prepared for the same activity. After preparation and review by the proponent group, the EIS must be submitted to Headquarters, Department of the Army, and, subsequently to CEQ for approval, before any major action is taken.

4. As part of CERL's research effort, a handbook has been assembled that is a step-by-step guide for preparing EIA's and EIS's. Included in the handbook is Chapter 2 of Army Regulation 200-1, "Environmental Consideration in DA Actions," which assigns responsibilities, establishes procedures for assessing the environmental impact of Department of the Army actions on the quality of the environment as required by NEPA, and implements Department of Defense Directive 6050.1, "Environmental Considerations in DOD Actions," dated 19 March 1974. In addition to the handbook, CERL has developed the Environmental Impact

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* A complete listing of significant documents establishing requirements for protection of environmental quality can be found in Appendix A of References 1 and 2.
** A list of EIS's prepared for military installations is provided in Appendix A. A list of sources that can be used for locating EIA's and EIS's prepared for specific areas is presented in Appendix B.
Computer System (EICS). The primary function of this automated system is to assist personnel preparing EIA's and EIS's in the identification of military activity impacts on the environment. As an aid to preparing the input data required by the EICS and interpreting its output, CERL requested that the U. S. Army Engineer Waterways Experiment Station (WES) undertake two tasks. The first task was to compile a list of environmental baseline elements for use in preparing a baseline description of a military installation or a specific project site. The second task was to assemble a catalog of environmental information sources compatibly indexed with the categories used by the EICS.

Objectives

5. The objectives of this study were to (a) develop a list of environmental elements that can be used to prepare a baseline description of a military installation or specific project site and (b) assemble a catalog of information sources that can be used as an aid in preparing the required input for the EICS and interpretation of its output, as well as providing background material for those personnel charged with preparation of EIA's and EIS's.
PART II: THE ENVIRONMENTAL IMPACT COMPUTER SYSTEM

6. Preparation of an EIA or EIS is a formidable task for Army personnel who are unfamiliar with NEPA and with environmental quality terminology. To alleviate part of this problem, CERL has constructed the EICS to aid personnel in identifying potential impacts of military activities on the environment.

Function of the EICS

7. The function of the EICS can be best visualized as a matrix that identifies relations between Army activities and characteristics of the environment. Army activities have been divided by CERL into nine functional areas:
   a. Administration and support
   b. Construction
   c. Industrial activities
   d. Mission change
   e. Operation and maintenance
   f. Procurement
   g. Real estate acquisition or outlease of land
   h. Research, development, testing, and evaluation
   i. Training

Characteristics of the environment have been divided into 13 technical specialties:
   a. Ecology
   b. Environmental health
   c. Air quality
   d. Surface water
   e. Groundwater
   f. Sociology
   g. Economics
   h. Earth science
1. Land use
2. Noise
3. Transportation
4. Aesthetics
5. Energy and resource conservation

Thus, a matrix can be constructed relating functional areas to technical specialties.

8. An impact between a particular functional area and one of the 13 technical specialties can be represented by an entry in the appropriate matrix intersection; however, in writing an EIA or an EIS, the information at this generalized level will probably be of little use, i.e., an entry in the matrix indicating an interaction between construction and economics may not be meaningful for a specific problem. A greater level of detail is needed. To meet this need, each functional area has been divided by CERL into basic activities associated with Army programs, e.g., some of the basic activities associated with construction are temporary roads, equipment fueling or maintenance, solid waste disposal, etc. The technical specialties have been divided into descriptive characteristics termed environmental attributes, e.g., some of the environmental attributes for ecology are small animals, birds, fish, reptiles, etc. Thus, the EICS is structured to have the capability of outputting basic Army activities under each functional area and environmental attributes under each technical specialty. For each functional area, a matrix of basic Army activities versus environmental attributes is available for each of the technical specialties. Some of the functional areas have been defined to be even more specific regarding the type of impacting activity. For instance, the construction functional area is divided into facility codes for specific types of construction projects, such as building supply facilities, family housing units, and airfields. If an airfield is to be constructed, a matrix of basic Army activities versus environmental attributes is available for each technical specialty and directed specifically toward airfield construction.
Input to the EICS

9. The EICS can be accessed by filling out an input form for the functional area of interest and transmitting it to CERL (Figure 1). CERL will input the coded data to the EICS and return the output. Input forms are available in the back of the appropriate user manual prepared by CERL for each functional area. Each manual describes the EICS and gives instructions on how data should be prepared for input and how to interpret the output.

10. The person preparing the input form for the EICS must have a general working knowledge of the proposed or existing Army activity under examination and the potential environmental problems that may result. In addition to general qualitative information, he may need some specific information pertinent to the activity and environmental characteristics of the site to answer questions on the input form relevant to the following:

   a. Technical specialties to be considered.
   b. Subprograms to be selected.
   c. Detail or review level attributes.
   d. Impact option.
   e. Answers to filter questions.
   f. Economic information about the activity.

11. Technical specialties that have no relevance to the site should be initially eliminated from consideration. For example, if a storage facility is to be constructed at a remote site, then possibly the environmental health, air quality, sociology, economics, noise, and aesthetics technical specialties need not to be considered. Codes for the remaining technical specialties should be entered in item 5 (Figure 1), and the total number in item 6.

12. The subprograms (item 7, Figure 1) to be selected depend on the functional areas being examined. If the construction functional area is being considered, a subprogram is chosen that corresponds to the facility code, i.e. construction of an airport or family housing units. Guidance for the selection of applicable subprograms for other
**INPUT FORM NUMBER 1 — CONSTRUCTION FUNCTIONAL AREA**

1. PROJECT NAME: ____________________________

2. INSTALLATION: ____________________________

3. RESPONDENT'S NAME: ________________________

TELEPHONE (COMM.): __________________________

ADDRESS: ____________________________________

4. ENVIRONMENTAL INFORMATION INPUT FOR SITE: __________________________

5. NUMBER OF TECHNICAL SPECIALTIES: ____________

6. DETAIL OR REVIEW LEVEL: ____________

7. NUMBER OF SUBPROGRAMS: ____________

8. IMPACT OPTION — A only — AB — ABC (circle one): __________________________

9. OUTPUT SELECTION: FACILITY CLASS CODE (SEE TABLE 2 FOR CODE NUMBERS)

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10. ANSWERS TO FILTER QUESTIONS ABOUT THIS SITE:

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II. IS DD FORM 1390 AND 1391 ATTACHED — YES — NO; OR STATE DOLLAR VALUE OF EACH FACILITY CLASS TO BE ASSESSED, AND NUMBER OF YEARS OF CONSTRUCTION FOR EACH FACILITY TO BE ASSESSED: __________________________

Figure 1. EICS input form for the construction functional area
functional areas can be obtained in the CERL user manual for the functional area.

13. Environmental attributes (paragraph 8) may be evaluated at the detail or review level (item 8, Figure 1). Examination of the impact of Army activities on attributes at the detail level provides adequate specificity for preparation of an EIA or EIS. Selection of the review level in item 8 will present a broad overview which will provide a useful summary of potential impacts for use at the management or general staff level. Guidance for the selection of the applicable level of evaluation is provided in the CERL Attribute Descriptor Package\textsuperscript{10} (paragraph 18).

14. Any particular activity may impact on virtually all the environmental attributes; however, a person who is assessing an environmental impact must identify the relative importance of the attributes in describing the impact. A "need-to-consider" scale was developed by CERL for the EICS to indicate which attributes are most likely to be impacted. The need-to-consider indicators are defined as follows:

\begin{itemize}
  \item A = definitely consider this attribute as being potentially impacted upon by the activity.
  \item B = possible impact requires consideration.
  \item C = consider impact in special cases.
  \item Blank = no known impact of activity on attribute.
\end{itemize}

An impact option is provided for the EICS user on the input form (item 9, Figure 1).

15. Specific problems related to the site are input to the EICS by answering a set of "filter" questions provided in the user manual for each functional area (item 10, Figure 1). Economic information pertinent to the activity (item 11, Figure 1) is supplied on standard Department of Defense forms that are attached to the EICS input form when it is submitted to CERL. If ramification and mitigation comments are desired, an appropriate entry is made in item 5 (Figure 1) following instructions provided in the user manual.

16. As indicated in paragraph 10 and further discussed in paragraphs 11-15, comprehensive subjective and objective information
is sometimes needed to complete the EICS input form. In many cases, the person responsible for preparing the form may not have the broad background knowledge required to effectively prepare all portions of the form. A source of supplemental information is needed to provide this adequate background information. CERL requested that WES undertake two tasks to meet this need. The first was to compile a list of environmental baseline elements that would alert a person to key factors that should be considered when impacts of Army activities on the environment are to be considered. This list of elements is presented in Part III (see also Appendix C). The second task was to assemble a catalog of environmental information sources that would provide guidance in understanding the terminology associated with completing the input form as well as the terms used in the list of environmental baseline elements. This catalog of environmental information sources is discussed in Part IV.

Output of the EICS

17. The EICS output consists of a matrix of Army activities versus environmental attributes (Figure 2). An impact between an activity and an attribute is represented by an intersection in the matrix containing an A, B, or C (as defined in paragraph 14). After verification that the attribute does exist, the full interrelation between the activity and the environment must be developed prior to preparation of an EIA/EIS. Four aids are available to help develop the needed relations:

a. CERL attribute descriptor package.

b. Ramification and mitigation comments (paragraph 15).

c. WES environmental baseline list (Part III).

d. WES information sources (Part IV).

18. The attribute descriptor package was developed by CERL to provide basic information about each attribute at the detail or review level. Each attribute available in the EICS is described in this document. The attribute descriptors are not available in the EICS output but are available as a separate document from CERL.
### Figure 2. Sample EICS output for the construction functional area

<table>
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<td>TEMPORARY ROADS</td>
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**Imp. Attr. Code, Attr. Name**

- IMP. CODE = 1710, SUB-PROGRAM NAME = FAMILY HOUSING
- TECHNICAL SPECIALTY = ECOLOGY

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<tr>
<td>26</td>
<td>COLD WATER FISHING</td>
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<td>20</td>
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<td>34</td>
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<td>OTHER UNDESIRABLE SPECIES</td>
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<td>41</td>
<td>IMPACTS ON GAME ANIMALS</td>
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<td>ENCROACHMENT ON NATURAL HABITATS</td>
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mitigation comments are available for various activities as part of the EICS output (see last column of matrix in Figure 2 for codes of pertinent comments; sample comments are provided in Figure 3). The ramification comments are directed toward describing the results of an impact or further explaining the impact of an activity on an attribute. Mitigation comments provide information on how impacts can be minimized or avoided.

19. The WES list of environmental baseline elements can be used as an aid to develop further information on environmental attributes. Using the list, attributes like small mammals can be described by terms found in the list, such as community composition, species occurrence, and species characteristics. Attachment of these terms to an attribute will help to develop a meaningful understanding of an Army activity impact on the attribute. Specific qualitative and quantitative information relevant to the various terms in the list can, in many cases, be obtained by consulting the WES catalog of environmental information sources (Part IV).
1061 /RAMIFICATIONS/
CONSTRUCTION OF TEMPORARY ACCESS ROADS MAY REPRESENT
THE FIRST MAJOR INTRUSION INTO A REMOTE BUILDING SITE.
NUMEROUS ACCESS ROADS MAY CAUSE MORE TERRAIN DAM-
AGE THAN THE PROJECT ITSELF.

/MITIGATIONS/
PLAN ACCESS ROADS CAREFULLY: IMPROVE THEM IF NECESSARY;
THEN RESTRICT DEVELOPMENT OF ALL OTHER ROADS AND PATHS.

1067 /RAMIFICATIONS/
TEMPORARY TOILET FACILITIES MAY CAUSE SEVERE, HAZARDOUS
CONTAMINATION OF SMALL, LOCAL DRAINAGE WAYS.

/MITIGATIONS/
REQUIRE THAT ALL TEMPORARY TOILETS ON SITES BE EQUIPPED
WITH APPROVED SEPTIC TANKS WITH SAFE DRAINAGES OR WITH
CLOSED HOLDING TANKS WHICH ARE EMPTIED ONLY INTO APPROVED
TREATMENT PLANTS, AND NEVER DUMPED INTO WATERSHEDS OR ON
THE SOIL SURFACE ON OR OFF THE INSTALLATION.

1073 /RAMIFICATIONS/
REMOVAL OF TREES DRASTICALLY ALTERS THE ECOLOGICAL
BALANCE AND AESTHETIC VALUE OF ANY AREA WHERE IT IS
DONE. IT REMOVES HABITAT FOR MANY ANIMALS, REMOVES FOOD
SOURCES FOR STILL OTHERS, STRESSES REMAINING SMALLER
PLANT ASSOCIATIONS AND OFTEN LEADS TO INCREASES IN PLANT
AND ANIMAL PESTS.

/MITIGATIONS/
REMOVAL OF TREES IS AN UNAVOIDABLE IMPACT IF THE SITE IS
TO BE USED. BUT CONTRACTS SHOULD CLEARLY SPECIFY LIMITS
OF CLEARING. ALTERNATE SITES MIGHT BE USED IF FORESTED
AREAS ARE LOCALLY SCARCE.

1076 /RAMIFICATIONS/
NATURALLY WET SITES SUPPORT A VERY WIDE VARIETY OF PLANT
AND ANIMAL SPECIES. DRAINAGE OF THESE SITES MAY HAVE FAR-
REACHING SECONDARY EFFECTS ON OTHER ANIMAL POPULATIONS
WHICH DEPEND ON THE MARSHY AREAS FOR FOOD PRODUCTION.

/MITIGATIONS/
IF NATURALLY WET SITES MUST BE UTILIZED FOR LACK OF AN
ALTERNATE, THESE EFFECTS ARE UNAVOIDABLE. DISCRIMINATE
DRAINAGE OF ALL WET SITES WHERE NO PRESSING PLANNED
USE FOR THE AREA IS ENVIRONMENTALLY UNACCEPTABLE.

1091 /RAMIFICATIONS/
BURNING OF BRUSH ON-SITE MAY STERILIZE SOILS THROUGH
HEAT, CAUSE UNCONTROLLED WOOD FIRES, AND EVENTUALLY CAUSE
SOIL EROSION. ITS DISPOSAL NEAR OR IN WATER FEATURES
CAUSES FLOODING, DETERIORATION OF WATER QUALITY AND THE
POSSIBILITY OF ENHANCING CONDITIONS FOR ANIMAL PESTS.

/MITIGATIONS/
PREPARE DISPOSAL TECHNIQUES FOR BRUSH INCLUDE
CHIPPING FOR SALE OR DISPERSED DISPOSAL, INCINERATION
IN APPROVED DEVICES, SHREDDING FOR COMPOSTING, AND
POSSIBLE SALE FOR FUEL.

1092 /RAMIFICATIONS/
BURNING OF TREES ON-SITE WILL DAMAGE REMAINING VEGETATION NOT
INTENDED TO BE REMOVED, CAUSE EVENTUAL SOIL EROSION AND RESULT
IN SAFETY HAZARDS DUE TO PRESENCE OF UNCONTROLLED FIRES,
WITH SUBSEQUENT DESTRUCTION OF ADJACENT ANIMAL AND PLANT
POPULATIONS.

/MITIGATIONS/
PREPARE DISPOSAL TECHNIQUES FOR TREES INCLUDE SALE FOR
TIMBER OR FIREWOOD, CHIPPING FOR USE IN MAINTAINING UNPAVED
ROADS AND FOOT PATHS, ON- AND OFF-USE FOR HUSBAND
RECREATIONAL STRUCTURES AND INCINERATION OF UNUSABLE TREES IN APPROVED
DEVICES.

1101 /RAMIFICATIONS/
WHEN THE UPPER STRATA OF THE SOIL ARE REMOVED, ALL PLANTS
AND ALMOST ALL ANIMAL SPECIES ARE DESTROYED. SUBSEQUENT
EROSION OF THE AREA MAY ALSO LEAD TO SILTATION OF NEARBY BODIES
OF WATER.

/MITIGATIONS/
SOIL SHOULD BE STRIPPED FROM AS SMALL AN AREA AS POSSIBLE, AND
AS CLOSE TO THE DATE OF CONSTRUCTION AS POSSIBLE. SOIL PILES
WHICH WILL REMAIN LONGER THAN 45 DAYS MUST BE SEEDED HEAVILY
WITH ANNUAL GRASSES IMMEDIATELY. SEDIMENT TRAPS MUST BE USED
IF ANY WATER BODIES ARE WITHIN 200 M (ABOUT 600 FT) DOWNSLOPE.

1180 /RAMIFICATIONS/
WHEN LARGE AREAS ARE PAVED, AS IN MAKING PARKING LOTS, THE
INCREASED RUNOFF WATER MAY CREATE BODIES OF STANDING WATER ON
PREVIOUSLY DRY SITES. THIS STAGNANT WATER MAY LEAD TO INCREASED
NUMBERS OF MOSQUITOS AND OTHER INSECT PESTS.

/MITIGATIONS/
PROVIDE IMPERVIOUS DRAINAGE CHANNELS FOR ALL PAVED SURFACES
WHICH DIRECT WATER TO EXISTING STORM CHANNELS OF ADEQUATE
CARRYING CAPACITY. AVOID GENERALIZED SURFACE SPILLAGE OF WATER.

1262 /RAMIFICATIONS/
ALL COMMON WOOD PRESERVATIVES ARE HIGHLY TOXIC TO LIVING PLANTS
AND ANIMALS, ESPECIALLY FISH. DISPOSAL OF EXCESS QUANTITIES HAS
OFTEN STERILIZED SOIL, KILLED FISH AND CAUSED THE DEATH OF
DESIRABLE ORNAMENTAL PLANTS.

/MITIGATIONS/
ENSURE THAT LEFTOVER QUANTITIES ARE NEVER DISPOSED OF ON-SITE
ON THE SOIL, IN WATER BODIES, IN DRAINAGE DITCHES OR DOWN STORM
DRAINS OR SANITARY SEWERS. DISPOSAL OF EMPTY CONTAINERS AND
EXCESS CHEMICALS SHOULD FOLLOW EPA GUIDELINES.

1285 /RAMIFICATIONS/
LANDSCAPING WITH EXOTIC SPECIES OR WITH POORLY ADAPTED SPECIES
HAS OFTEN INTRODUCED WEEDS AND PESTS INTO DISTURBED AREAS AROUND
CONSTRUCTION SITES, WHERE THEY FLOURISH. FUNGICIDES, INSECTICIDE,
AND FERTILIZERS USED ON NEW PLANTINGS OFTEN WASH INTO BODIES
OF WATER, UPSETTING EXISTING PLANT AND ANIMAL LIFE.

/MITIGATIONS/
USE CERTIFIED SEED SOURCES AND NURSERY STOCK KNOWN TO BE ADAPTED
TO THE AREA. PLANT IMMEDIATELY FOLLOWING CONSTRUCTION SO SITE IS
NOT LEFT OPEN TO INVASION. FOLLOW LABEL DIRECTIONS IN USE OF CHEM-
ICAL PRODUCTS RIGOROUSLY. APPLY FERTILIZERS IN QUANTITIES CALCU-
LATED NOT TO EASILY LEACH OUT OF THE SOIL.

Figure 3. Sample ramification and mitigation comments for the construction functional area
PART III: ENVIRONMENTAL BASELINE ELEMENTS

20. An evaluation of the total impact of Army activities on the environment requires that an inventory of basic environmental data be available for the activity area. This set of data will be an aid in the preparation of EIA's and EIS's as well as providing a base for future reference, so that temporal changes in the environmental quality of the area and its surroundings can be identified and evaluated. This collection of basic data is generally referred to as an environmental baseline.

21. Each project or activity site will have unique characteristics that must be considered in constructing a baseline. The assembly of a baseline that would be universally applicable is very difficult. At best, it would be a collection of nonexclusive categories containing poorly defined groups that are not internally consistent at the same information level. Clearly, a baseline is site dependent.

22. A list of terms that will serve as the building blocks for a site-dependent baseline is needed. Such a list is provided in Appendix C. An examination of the list shows that the various elements are both qualitative and quantitative and represent basic, general, and derived data. Thus, the list can serve only as a source for the development of concepts that must be translated into terms that are applicable to the site under consideration.

23. The list of environmental baseline elements (Appendix C) is useful for other purposes. Personnel can use the list as a guide for preparing input forms for the EICS as well as for interpreting the output (paragraphs 16, 17, and 19). If an analytical model is required to examine a cause-and-effect relation between an Army activity and an environmental attribute, the list will give some initial direction as to what parameters should be incorporated into the model, even though the discrete parameters of the model may not be identified in the list per se. At a more general level, the list will provide guidance for master planners, personnel involved in environmental quality and resource management, and decision makers at higher headquarters.
involved in selecting alternatives and general mission planning.

24. The format of the list was structured around the thirteen CERL technical specialties (Figure 1); however, several of the specialties are so broad in scope that they were divided into two or more subcategories to be more meaningful; further divisions were made, as needed, to introduce key concepts.
PART IV: CATALOG OF ENVIRONMENTAL INFORMATION SOURCES

25. A catalog of currently available environmental information sources has been assembled at WES. This listing provides an invaluable number of information sources for those personnel using the EICS or preparing EIA's and EIS's. The catalog is arranged according to the CERL technical specialties. Some of the specialties are subdivided to narrow the scope of the subject matter (Table 1). Note that the EICS, the list of environmental baseline elements, and the catalog of information sources have a common arrangement of major divisions based on the CERL technical specialties.

Structure of the Catalog

26. When information is needed, numerical data are generally the most desirable because they can be extracted rapidly, and hopefully used without modification, for the purpose intended. However, if numerical data are not readily accessible with available resources, the next course of action is to contact directly an agency having the desired data or to locate an agency having the data through a directory or information service. As a last resort, the data can be collected on site. Following this rationale, the catalog of information sources is arranged into eight informational content types as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Numerical information sources</td>
</tr>
<tr>
<td>2</td>
<td>Numerical information systems</td>
</tr>
<tr>
<td>3</td>
<td>Addresses of information sources</td>
</tr>
<tr>
<td>4</td>
<td>Directories of information sources</td>
</tr>
<tr>
<td>5</td>
<td>Information sources describing methods to collect data</td>
</tr>
<tr>
<td>6</td>
<td>Information sources describing instrumentation used for collecting data</td>
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<td>7</td>
<td>General information sources</td>
</tr>
<tr>
<td>8</td>
<td>General information systems</td>
</tr>
</tbody>
</table>
27. Type 1 above consists of a list of published documents that contain numerical data and maps from which information can be extracted rapidly. Type 2 is comprised of a list of automated numerical information systems. Access to these systems must generally be obtained via on-site or remote computer facilities or by submitting written or telephone requests to the agency that maintains the system.

28. Type 3 consists of a list of addresses of agencies that can provide information and referrals. Type 4 is comprised of a list of published directories of information sources. Many of these directories have specific addresses (and some telephone numbers) of agencies that can provide numerical information directly or can give referrals to sources of information.

29. Type 5 consists of a listing of published documents specifically related to methods of collecting data, and Type 6 is comprised of a listing of documents describing instrumentation used to collect data.

30. Type 7 consists of a list of published documents, including periodicals, that are of a qualitative or quasiquantitative nature. This group was included in the reference list to aid a person using the EICS or charged with writing an EIA or EIS, who is not familiar with the terminology of a particular problem area. Also, if no numerical data are available, no agencies have the desired information, and data cannot be collected, the information sources in Type 7 can possibly be interpreted to provide needed data from the qualitative descriptions available in the documents in this group. Type 8 is comprised of a list of automated information systems containing information sources of the same type as the published documents included in Type 7. As with Type 2, computer access must be obtained from the agency maintaining the system.

31. The information sources are arranged in 27 environmental categories as shown in Table 1. This arrangement is hereafter referred to as the WES environmental categories. Under each of the environmental categories are the eight informational content types listed in paragraph 26. Hence, there are 216 combinations of environmental categories.
and informational content types available for categorizing the information sources.

32. A matrix summary of the information contained in the catalog at this writing is provided in Figures 4, 5, and 6. The information in Figure 4 indicates the number of sources available within each environmental category. Figures 5 and 6 include sources primarily related to domestic (U.S.) and foreign regions, respectively. The row in each matrix is an environmental category, and each column is an informational content type.

Automated Retrieval from the Catalog of Environmental Information Sources

33. WES has developed an automated system for the retrieval of information sources from the catalog that affords the user rapid access to any desired listing of sources. The retrieval program is written in a conversational mode, whereby the user can easily select any list of information sources desired. The user will have the option of limiting the search by selecting categories from either the 13 CERL technical specialties or the WES 27 environmental categories (Table 1) and from the eight informational content types (paragraph 26). After searching the catalog of information sources for the code combinations specified, the automated system will print out a list of the requested sources at the teletype or on a high-speed printer. The automated system will provide an up-to-date listing of information sources quickly and reliably on a teletype terminal anywhere within the contiguous United States. A sample output listing is provided in Figure 7.

Program operation

34. Preliminary preparation. To use the retrieval program, the user needs only a teletype with an audio coupler and a telephone, but access must be authorized by prior arrangement with CERL.* When authority

* Information concerning authorization for use of the system can be obtained by writing: Director, U. S. Army Engineer Construction Engineering Research Laboratory, ATTN: CERLESS, P. O. Box 4005, Champaign, Illinois 61820.
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* See paragraph 26.
** See paragraph 31.

Figure 4. Numerical summary of references to information sources available in catalog by informational content type and WES environmental category.
### Table: Numerical Summary of References to Information Sources Available in Catalog (Domestic) by Informational Content Type and WES Environmental Category

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* See paragraph 26.
** See paragraph 31.

Figure 5. Numerical summary of references to information sources available in catalog (domestic) by informational content type and WES environmental category.
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<td>Communications</td>
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<td>Economics</td>
<td>248</td>
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<tr>
<td>Soils and Geology</td>
<td>71</td>
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<td>Land Use</td>
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<td>Noise</td>
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<td>1</td>
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<td>59</td>
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<tr>
<td>Public Utilities</td>
<td>53</td>
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</tr>
</tbody>
</table>

* See paragraph 26.
** See paragraph 31.

Figure 6. Numerical summary of references to information sources available in catalog (foreign) by informational content type and WES environmental category.
### Population

**Numerical Information Sources**

<table>
<thead>
<tr>
<th>Source</th>
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<tr>
<td>ACADEMIEI REPUBLICII SOCIALISTE ROMANIA, ATLASUL REPUBLICII SOCIALIST REPUBLIC</td>
<td>Bucharest, Romania, 1972</td>
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<tr>
<td>ANONYMOUS, THE ULSTER YEARBOOK, HER MAJESTY'S STATIONARY OFFICE, BELFAST, IRELAND, 1974</td>
<td>*</td>
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<tr>
<td>ARBINGAST, S., ET AL., ATLAS OF TEXAS, UNIVERSITY OF TEXAS PRESS, AUSTIN, 1967</td>
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<td>BIESERMAN, P., THE ECONOMIC ALMANAC, MACMILLAN, NEW YORK, 1968</td>
<td>*</td>
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<tr>
<td>BIOR PUSAT STATISTIK, STATISTICAL POCKETBOOK OF INDONESIA, DJA KARTA, INDONESIA, 1969</td>
<td>*</td>
</tr>
<tr>
<td>BORCHERT, J. AND YAEGER, D., ATLAS OF MINNESOTA RESOURCES AND SETTLEMENT, MINNESOTA STATE PLANNING AGENCY, ST. PAUL, 1969</td>
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<tr>
<td>BROOKS, J., THE OREGON ALMANAC AND BOOK OF FACTS, BINFORD AND MORT, PORTLAND, 1961</td>
<td>*</td>
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<tr>
<td>BRYANT, W., STATISTICAL ABSTRACT OF OHIO-1969, DEVELOPMENT DEPARTMENT, STATE OF OHIO, COLUMBUS, 1969</td>
<td>*</td>
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<tr>
<td>BUREAU DE LA STATISTIQUE DU QUEBEC, ANNUAIRE DU QUEBEC (YEARBOOK OF QUEBEC), QUEBEC, CANADA, 1973</td>
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<tr>
<td>BUREAU FEDERAL DE STATISTIQUE, ANNuaIRE STATISTIQUE DE LA SUISSE (STATISTICAL YEARBOOK OF SWITZERLAND), BERN, SWITZERLAND, 1968</td>
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<tr>
<td>BUREAU OF STATISTICS, ANNUAL STATISTICAL ABSTRACT-1969, SUVA, FIJI, 1969</td>
<td>*</td>
</tr>
</tbody>
</table>

* Information source primarily references data for locations outside the United States

---

Figure 7. Sample listing of information sources
for use of the system has been granted, the requestor will be assigned a telephone number, a user number, and a password. All output, unless requested otherwise, will be printed out at the teletype. Prior to accessing the program, the user should be familiar with the procedures for operating the WES G-635 computer in the time-sharing mode (paragraphs 44-47).

35. **Program access and start.** Once a telephone number, user number, and password have been assigned, and the user has a good knowledge of the program capabilities, then the telephone number must be dialed to attain a carrier signal from the WES computer. The computer will initiate a "conversation" with the user, asking for his user number (USER ID) and password. After each entry by the user, the carriage return key (RTN) must be depressed. The user is allowed two tries to type in both the user number and password properly. If the user fails to enter the proper user number or password, the computer will sign off with either ILLEGAL ID or ILLEGAL PASSWORD. If this occurs, the user must dial the telephone number for the carrier signal and try again.

36. Once the user has entered the proper user number and password, the computer will ask: SYSTEM?. The retrieval program is written in FORTRAN, and a compiled copy is stored under the file name RPIS1. The user must tell the computer that the program is in FORTRAN; because the program is already compiled in a random file, it cannot be accessed directly as an old file, so the computer must be told that the user wants to enter a new file. The user can accomplish this on one line by typing FORT N for FORTRAN subsystem and a new file. The computer will acknowledge this request with: READY and an asterisk. If FORT N is incorrectly entered, the computer will respond with 009-SYSTEM UNKNOWN and will ask again for the system until it is properly entered.

37. When the computer has responded with READY, the user may initiate the retrieval program by simply entering: RUN RPIS1. After a few seconds, the program will start operation with the initial message: I AM RPIS, THE RETRIEVAL PROGRAM FOR INFORMATION SOURCES..., (Figure 8). If the program name is incorrectly entered, the computer will respond
**Figure 8. Sample computer output showing access of catalog of environmental information sources using RPI**
with: <50> FILE (Incorrect entry) --NON EXISTENT FILE--. In this case, the user must retype the run command: RUN RPIS1.

38. Program operation and output. The retrieval program is written in a conversational mode and asks for periodic entries from the user so that he can obtain the desired information sources. Generalized and detailed flowcharts of the retrieval program are provided for the user in Figures 9 and 10. Careful inspection of Figure 10 will aid the user in knowing what information will be required to run the program and what alternatives are available to him during the program operation.

39. After the user has entered code numbers for locating the desired lists of information sources, he may have to wait a few minutes, depending on how busy the computer is at the time. Once the search is finished, the program will respond with: I WAS ABLE TO LOCATE XXXX INFORMATION SOURCES FOR YOU. With the knowledge of how many information sources were located, the user is asked to choose between having the lists typed on the teletype or written onto a file that can be dumped on a high-speed printer. If the program finds a large number of sources for the user (greater than 50), clearly the high-speed printer is the desired alternative. If this alternative is chosen, complete step-by-step instructions are included in the program on how to have the file dumped. The lists dumped on the high-speed printer will be mailed to the user at the address he enters during the operation of the program. If the user decides to have the file dumped on the high-speed printer, he should do so immediately after the program terminates to insure that the file in which the requested information sources is written will not be destroyed.
Figure 10. Detailed flow diagram of RPIS
40. **Terminating and rerunning the program.** The retrieval program will terminate automatically after it has finished operation. The computer will signal this termination by typing an asterisk. If, for any reason, the user wishes to rerun the program he may do this by typing: RUN RPIS1 again. This will once again initiate the retrieval program.

41. **Addition of new information sources.** After the user has received a listing for the requested information sources, he may know of other sources which should possibly be included in the information system. A program entitled NEWINFO is available to provide this capability. To start this program, the user must first follow the steps in paragraph 37. When the computer responds with an asterisk, the user enters: RUN NEWINFO and the program will start. The program will ask a series of questions about the source, including information on the WES categories that apply to the source. A sample run of NEWINFO is provided as Figure 11. Lists of the information sources will be periodically dumped from NEWINFO and evaluated for inclusion within the system. The approved references will then be added to the system at regular intervals.

42. **Terminating the connection.** When the user is finished with the automated retrieval system and is ready to terminate the connection with the computer, he types: BYE. The computer will acknowledge this request and respond with the time of sign off, resources used, and finally CP DISCONNECT. This signals that the carrier signal has been stopped and the computer connection terminated.

43. **Problems.** Should a user encounter any difficulties using these instructions or operating the retrieval program, he should immediately contact CERL, commercial telephone number (217) 352-6511 or FTS telephone number, 958-7011.

Basic time-sharing operating instructions

44. Before operating the retrieval program, the user should be familiar with a few basic time-sharing operating procedures on the WES computer. These procedures include an understanding of the carriage
I AM NEWINFO, THE PROGRAM WHICH CAN BE USED TO BRING MISSING INFORMATION SOURCES TO CERL ATTENTION.

PLEASE FOLLOW THE INSTRUCTIONS CAREFULLY. I WILL ASK YOU A SERIES OF QUESTIONS ABOUT THE INFORMATION SOURCE YOU WISH TO ADD. AFTER EACH = SIGN APPEARS, TYPE THE REQUESTED INFORMATION AND DEPRESS THE RETURN KEY. IF THE REQUEST DOES NOT APPLY TO THE INFORMATION SOURCE, THEN TYPE 'NONE' OR 'NOT APPLICABLE', BUT BE SURE TO PROVIDE SOME ANSWER FOR ALL QUESTIONS.

AUTHOR'S NAME? (IF UNKNOWN, SO STATE)
=NEVILLE, A.M.; KENNEDY, J.B.

TITLE?
=BASIC STATISTICAL METHODS

PUBLISHER?
=INTERNATIONAL TEXTBOOK COMPANY

DATE?
=1968

REPORT, AD, OR NTIS NUMBER?
=NONE

PERIODICAL? (YES OR NO) IF YES, TYPE IN HOW OFTEN IT IS PUBLISHED IF YOU KNOW.
=NO

TYPE IN THE WES CATEGORY NUMBERS WHICH APPLY TO THE INFORMATION SOURCE. SEPARATE THESE NUMBERS WITH COMMAS.
=13, 14, 15, 16, 17, 18, 19

ARE THERE ANY MORE INFORMATION SOURCES WHICH NEED TO BE ADDED(1) OR NOT(0)? WHEN THE = SIGN APPEARS, TYPE 1 OR 0 AND DEPRESS THE RETURN KEY.
=1

AUTHOR'S NAME? (IF UNKNOWN, SO STATE)
=NONE

TITLE?
=THES, THE YEARBOOK OF AGRICULTURE

PUBLISHER?
=U.S.GOVERNMENT PRINTING OFFICE

DATE?
=1949

REPORT, AD, OR NTIS NUMBER?
=UNKNOWN

PERIODICAL? (YES OR NO) IF YES, TYPE IN HOW OFTEN IT IS PUBLISHED IF YOU KNOW.
=NO

TYPE IN THE WES CATEGORY NUMBERS WHICH APPLY TO THE INFORMATION SOURCE. SEPARATE THESE NUMBERS WITH COMMAS.
=2, 24, 25, 26, 27

ARE THERE ANY MORE INFORMATION SOURCES WHICH NEED TO BE ADDED(1) OR NOT(0)? WHEN THE = SIGN APPEARS, TYPE 1 OR 0 AND DEPRESS THE RETURN KEY.
=0

Figure 11. Sample run of NEWINFO
return key, what the user should do in case of input errors, interrupting the program, and the busy file message.

45. **Carriage return.** After each input by the user, the carriage return key (RTN or RETURN) must be depressed to let the computer know that you have finished entering data. This applies to all entries by the user. Striking the RTN or RETURN key returns system control to the computer, and the program will not proceed until this is done.

46. **User errors.** Typing errors by the user sometimes occur. Below are three cases to consider:

   a. If an error by the user is recognized prior to carriage return, he may use either the correction symbol @ or the control X sequence. The correction or eliminator symbol may be used to eliminate any number of characters starting with the character farthest right on the line. For example: 180 will be read by the computer as 0; whereas, SMOTHH@IITH will be read SMITH. The control X sequence allows the user to start from scratch on a new line. To achieve this, the user must strike the CTRL (sometimes CTL) key, and simultaneously hit the X key. The computer will respond with DEL and space to the next line and await your new line.

   b. Some editing of user inputs is done by the retrieval program. If an incorrect input is detected, the program will request a corrected input from the user. For example, if the computer requests an input of either 1, 2, or 3, and the user mistakenly inputs a 4, the computer will respond with: THE VALUE YOU INPUT IS NOT ALLOWED. PLEASE TRY AGAIN. The user may then input the proper response and the program continues.

   c. If the user decides, during the operation of the program, that the restrictions he placed on the search are incorrect, the program must be stopped and restarted. This is done by striking the BREAK or BRK key, and when the computer responds with an asterisk, the program can be restarted.

47. **Busy file message.** If two users try to access and run the retrieval program simultaneously, only one will succeed (the one who types RUN RPIS1 first). When the other user types in RUN RPIS1, the computer will respond with: <50> FILE RPIS1 — FILE BUSY. If this message occurs, the user should wait a few minutes and try again.
Normal operation of the program should take no more than 15 min. If the user does not wish to wait, he may terminate the connection and try again later by signing on again.
REFERENCES

1. LaGarde, V. E. et al., "Selected Legally Protected Animals, Inventory for Use by United States Army Installations and Major Activities in the Continental United States," Technical Report M-75-2, Report 1, Jun 1975, U. S. Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss.

2. Rekas, A. M. B. et al., "Selected Legally Protected Animals, Inventory for Use by Corps of Engineers Division and District Offices in the Contiguous United States," Technical Report M-75-2, Report 2, Jun 1975, U. S. Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss.


Table 1
Structure of Catalog of Environmental Information Sources

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<thead>
<tr>
<th>CERL Technical Specialties</th>
<th>WES Environmental Categories</th>
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<td>Ecology</td>
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33
APPENDIX A: LISTING OF ENVIRONMENTAL IMPACT STATEMENTS
PREPARED FOR MILITARY INSTALLATIONS

The following is a list of Environmental Impact Statements (EIS's) compiled for military installations as of 20 May 1976 from a list furnished by the Council on Environmental Quality (CEQ) and the Environmental Law Institute (ELI). Copies of specific EIS's published prior to March 1974 are not available from CEQ but can be obtained from the National Technical Information Service (NTIS) (5285 Port Royal Road, Springfield, Virginia 22151). Documents published after this date can be secured from ELI Document Service. CEQ will provide ELI accession numbers and NTIS order numbers for specific EIS's on request.

<table>
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<tr>
<th>Status</th>
<th>Statement Title</th>
<th>CEQ/ELI Accession Number</th>
<th>Date Filed With CEQ</th>
<th>NTIS Order Number</th>
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<tr>
<td>DRAFT</td>
<td>Norton AFB, San Bernardino</td>
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<td>AWACS Beddown at Tinker AFB</td>
<td>60596</td>
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<td>11-05-71</td>
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<td>05-11-72</td>
<td>PB-203 238-F</td>
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<td>Tyndall Air Force Base</td>
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<td>Housing Units, Eglin AFB</td>
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<td>South Approach, Golden Gate Bridge, Presidio</td>
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<td>Disposal of Agents and Weapons, Pine Bluff Arsenal</td>
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<td>Walter Reed General Hospital</td>
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Department of Defense, Navy

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APPENDIX B: SOURCES OF DRAFT AND FINAL ENVIRONMENTAL IMPACT ASSESSMENTS AND ENVIRONMENTAL IMPACT STATEMENTS

1. Summaries of Environmental Impact Statements (EIS's) that have been filed by Federal agencies with the Council on Environmental Quality (CEQ) under the provisions of the National Environmental Policy Act (NEPA) are published monthly in the "102 Monitor."11* This document has been published since March 1972 but does not have a cumulative index by agency or subject matter. The Environmental Law Institute (ELI) can provide a listing of EIS's by Federal agency from which a list can be compiled by subject area. The listing of EIS's for military installations in Appendix A was compiled from a list furnished by ELI (1346 Connecticut Avenue, N.W., Washington, D. C. 20031).

2. EIS's can also be obtained from the Federal agencies who generate and serve as repositories for the EIS's. Addresses and telephone numbers for these agencies are as follows:

Department of Agriculture
Coordinator of Environmental Quality Activities
Office of the Secretary
U. S. Department of Agriculture
Room 359-A
Washington, D. C. 20250
(202) 447-3965

Atomic Energy Commission
For Non-Regulatory Matters:
Office of Assistant General Manager
E-201, AEC
Washington, D. C. 20545
(301) 973-4241

For Regulatory Matters:
Deputy Director for Reactor Projects
Directorate of Licensing
P-722, AEC
Washington, D. C. 20545
(301) 973-7373

* Raised numbers refer to similarly numbered items in the References at the end of the main text.
Department of Commerce
Deputy Assistant Secretary for
Environmental Affairs
Department of Commerce
Washington, D. C. 20230
(202) 967-4335

Department of Defense, Air Force
Room 4D 873, The Pentagon
Washington, D. C. 20330
(202) 0X7-9297

Department of Defense, Army
Acting Chief, Environmental Office
Directorate of Installations
Office of the Deputy Chief of Staff
for Logistics
Washington, D. C. 20310
(202) 0X4-4269

Department of Defense, Army Corps of Engineers
Director, Office of Public Affairs
ATTN: DAEN-PAP
Office of the Chief of Engineers
U. S. Army Corps of Engineers
1000 Independence Avenue, S. W.
Washington, D. C. 20314
(202) 693-6861

Department of Defense, Navy
Special Assistant to the Assistant
Secretary of the Navy (Installations
and Logistics)
Washington, D. C. 20350
(202) 692-3227

Energy Resources Development Administration
Office of Assistant Administrator
E-201, ERDA
Washington, D. C. 20545
(301) 973-4241

Environmental Protection Agency
Director, Office of Federal Activities
Room 3630 Waterside Mall
Washington, D. C. 20460
(202) 755-0940
Federal Energy Administration
Director, Environmental Impact Division
Federal Energy Administration
New Post Office Building
12th and Pennsylvania Avenue, NW
Washington, D. C. 20461
(202) 961-6214

Federal Power Commission
Advisor on Environmental Quality
441 G. Street, NW
Washington, D. C. 20426
(202) 386-6084

General Services Administration
Executive Director of Environmental Affairs
General Services Administration
18th and F Streets, NW
Washington, D. C. 20505
(202) 343-4161

Department of Health, Education, and Welfare
Director, Office of Environmental Affairs
Office of the Assistant Secretary for Administration
and Management
Room 3718 HEW-North
Washington, D. C. 20202
(202) 963-4456

Department of Housing and Urban Development
Director, Office of Environmental Quality
Room 7258
451 7th Street, SW
Washington, D. C. 20410
(202) 755-6308

Department of Interior
Director, Environmental Project Review
Room 7260
Department of the Interior
Washington, D. C. 20240
(202) 343-3891

Interstate Commerce Commission
Supervisory Attorney Advisor for the Environmental Staff
Room 2370
12th St. and Constitution Avenue, NW
(202) 343-2086
National Aeronautics and Space Administration
Special Assistant, Office of Administration
NASA
Washington, D. C. 20546
(202) 962-8107

National Science Foundation
Deputy Assistant to the Director
National and International Programs
Room 703
Washington, D. C. 20550
(202) 632-180

Nuclear Regulatory Commission
Director of Division of Reactor Licensing
P-722, NPC
Washington, D. C. 20555
(301) 492-7373

Postal Service
Director, Office of Buildings Analysis and Design
Real Estate and Buildings Department
U. S. Postal Service
Washington, D. C. 20260
(202) 245-4242

State Department
Special Assistant to the Secretary
for Environmental Affairs
Room 7819
Washington, D. C.
(202) 632-7964

Tennessee Valley Authority
Director of Environmental Planning
720 Edney Building
Chattanooga, Tennessee 37401

Department of Transportation
Director, Office of Environmental Affairs
400 7th Street, SW
Washington, D. C. 20590
(202) 426-4357

Treasury Department
Assistant Director
Office of Tax Analysis
Room 4205
Washington, D. C. 20220
(202) 964-2797
3. Personnel seeking to locate Environmental Impact Assessments (EIA's) or EIS's on a regional basis can consult the U. S. Bureau of the Budget Circular A-95. This document contains a listing of state, metropolitan, and regional clearinghouses. Pursuant to the Intergovernment Cooperation Act of 1968, any agency of government or any organization or individual undertaking to apply for assistance for a project under a Federal program is required to notify the planning and development clearinghouse of the state (or states), the region, if there is one, or the metropolitan area in which the project is to be located. While the clearinghouses do not, in most cases, serve as repositories for EIA's and EIS's, a record of EIA's and EIS's for projects within the areal jurisdiction of the clearinghouse is maintained. Thus, if an EIA or EIS is to be prepared for a military activity in a specific area, the clearinghouse for that area can be contacted to find out if there are other EIA's or EIS's that would provide direction for EIA/EIS preparation related to the military activity.
APPENDIX C: LISTING OF ENVIRONMENTAL BASELINE ELEMENTS

This appendix contains a list of environmental baseline elements that may serve as the basis for constructing an environmental baseline description for an entire military installation or for a specific project. This list should not be considered as all-inclusive, but as outlined below, it does represent an attempt at identifying components that broadly describe the various sectors of the environment.

Ecology

1. Vegetation
   a. Community composition
      (1) Terrestrial (trees, shrubs, herbs, grasses)
      (2) Aquatic (marine or freshwater)
      (3) Important taxa (commercial, recreational, aesthetic, ecological, legally protected, etc.)
   b. Species occurrence
      (1) Range
      (2) Distribution
   c. Species characteristics
      (1) Habitat requirements
         (a) Climatic (precipitation, temperature, etc.)
         (b) Physical (soil moisture, elevation, etc.)
         (c) Chemical (nutrients, etc.)
         (d) Biological (pollinators, disseminators, etc.)
      (2) Density (or percent ground cover)
      (3) Structural characteristics (height, stem and crown diameter, growth rate and reproduction potential, blade density, strength, etc.)
      (4) Nutrient value (leaves, stems, roots, fruits)
      (5) Diseased or noxious species
      (6) Threatened or endangered species
   d. Value potential of species
      (1) Erosion prevention
(2) Wildlife habitat
(3) Field crops, orchards, timber
(4) Recreational or aesthetic
(5) Maintenance of ecological balance
(6) Grazing
e. Response to imposed stresses (management, construction, flooding, training, etc.)
f. Response to sporadic extremes (flood, drought, temperature, wind, fire, etc.)
g. Local, state, and Federal legislation relevant to threatened or endangered species

2. Wildlife
a. Community composition
   (1) Terrestrial vertebrates (mammals, birds, etc.)
   (2) Terrestrial invertebrates (insects, etc.)
   (3) Aquatic vertebrates (fish, amphibians)
   (4) Aquatic invertebrates (mollusks, insects, etc.)
   (5) Important taxa
b. Species occurrence
   (1) Range
   (2) Distribution
   (3) Migration routes
c. Species characteristics
   (1) Habitat requirements
      (a) Climatic (precipitation, temperature, etc.)
      (b) Physical (elevation slope, soil type, shelter, etc.)
      (c) Chemical (air quality, water quality, toxic material, etc.)
      (d) Biological (food, prey, etc.)
   (2) Density
   (3) Reproductive potential and longevity
   (4) Diseased or noxious species
   (5) Threatened or endangered species
d. Value potential of species
(1) Economic
(2) Recreational or aesthetic
(3) Maintenance of ecological balance

e. Response to imposed stresses (agriculture, construction, recreation, training, etc.)

f. Response to sporadic extremes (flood, drought, temperature, wind, fire, etc.)

g. Local, state, and Federal legislation relevant to threatened or endangered species

Environmental Health

1. Health

a. Sources of health records

b. Type of health records that are maintained

c. Health problems in area

d. Local, state, and Federal health standards

2. Safety

a. Sources of safety data

b. Type of safety records that are maintained

c. Safety problems in area

d. Local, state, and Federal safety regulations

3. Health care services

a. Health care services available

(1) Primary care

(2) Emergency care

(3) Alcohol abuse

(4) Drug abuse

(5) School health

(6) Physical rehabilitation

(7) Home care

(8) Comprehensive care for elderly and handicapped

(9) Mental rehabilitation

b. Health care problems in area
4. Health facilities (hospitals, clinics, rehabilitation centers, etc.)
   a. Services available at facility
   b. Area served
   c. Needs for expansion or improved service capability
   d. Patient statistics

5. Health personnel (physicians, dentists, nurses, pharmacists)
   a. Personnel assigned to specific health facilities
   b. Personnel in area compared with state average
   c. Personnel in area compared with national average
   d. Shortages

6. Resources for emergency medical needs
   a. Ambulance services
   b. Fire departments
   c. Specialized rescue units
   d. Communication systems

Air Quality

1. Climatology
   a. Temperature
   b. Wind
   c. Relative humidity
   d. Dew point
   e. Evaporation rate
   f. Precipitation
   g. Storm records
   h. Insolation
   i. Atmospheric pressure
   j. Visibility

2. Air pollution
   a. Pollutant sources (point, line, areal)
   b. Concentration of gases and particulates
c. Temperature inversions
d. Lapse rates
e. Mixing depth
f. Local, state, and Federal air-quality standards

Surface Water

1. Surface-water hydrology
   a. Classification of water bodies (lake, river, etc.)
   b. Watershed boundaries
c. Gaging station data
      (1) Discharge
      (2) Velocity
      (3) Stage
      (4) Bank-full stage
      (5) Flood records
      (6) Water temperature
      (7) Sediment load
d. Channel characteristics
      (1) Width at top of banks
      (2) Bank angle
      (3) Bank height
      (4) Manning's 'n'
      (5) Bottom width
      (6) Bed gradient
e. Surface-water utilization (public water supply, transportation, recreation, irrigation, electric power, etc.)

2. Water quality
   a. Turbidity
   b. Temperature
c. Color
d. Taste and odor characteristics
e. Solids (suspended, floating, volatile, dissolved)
f. Liquids (oils, industrial effluents, etc.)
g. Biochemical oxygen demand
h. Dissolved oxygen
i. Nutrients
j. pH
k. Radioactivity
l. Aquatic life
m. Fecal coliform count
n. Responses to water-quality management
o. Local, state, and Federal legislation relevant to water-quality standards

Groundwater

1. Aquifers
   a. Location and areal extent
   b. Depth to aquifer
   c. Velocity of movement
   d. Thickness
   e. Composition

2. Water table
   a. Location and areal extent
   b. Depth to water table
   c. "Safe yield"

3. Aquicludes
   a. Location and areal extent
   b. Depth to aquiclude
   c. Composition

4. Locations of surface exposures

5. Utilization (public water supply, irrigation, industrial, etc.)

6. Quality of groundwater (see "Water quality" under "Surface Water" for suggested terms to be considered)

7. Response to groundwater management
Sociology

1. Population
   a. Statistics
      (1) Population (cities, counties, urban areas, suburban areas, subdivisions, military reservations, etc.)
      (2) Land areas
      (3) Population densities
   b. Growth (or decay)
      (1) Changes in population (births, deaths, people moving into and out of area)
      (2) Projected growth
      (3) Growth related to specific activities
      (4) Timing of growth related to other characteristics
      (5) Ultimate population
      (6) Locations where growth is most likely
      (7) Growth compared with rest of county or state
   c. Composition
      (1) Male; female
      (2) Institutional
      (3) Foreign national
      (4) Ethnic groups
      (5) Age distribution
      (6) Married
      (7) Divorced
      (8) Families
      (9) Children per family

2. Labor
   a. Annual rate of new jobs available; jobs lost
   b. Composition of labor force
      (1) Total number of workers
      (2) Age distribution
      (3) Employment by Standard Industrial Class (SIC)
      (4) Income distribution for workers (age, SIC, sex)
(5) Unemployed workers (age, SIC, sex)
(6) Workers in civilian/military labor force
(7) Females in civilian/military labor force
(8) Union members
(9) Professionals
(10) Workers living outside of impacted area
(11) Workers using public transportation

3. Housing
   a. Total number of units
   b. Year-round units
   c. Rooms per unit
   d. Single-owner units
   e. Multiple-owner units
   f. Cost of single- and multiple-owner units
   g. Single-rental units
   h. Multiple-rental units
   i. Monthly tenant fee for single- and multiple-rental units
   j. Mobile homes
   k. Mobile homes spaces
   l. Owner units being subsidized
   m. Rental units being subsidized
   o. Occupancy rates (single-owner, multiple-owner, single-rental, multiple-rental, owner-subsidized, rental-subsidized, mobile home spaces)
   p. Factors that influence variation in occupancy rates
   q. Units without:
      (1) Indoor plumbing
      (2) Air conditioning
      (3) Telephone
      (4) An automobile
   r. Heads of households that are female

4. Social benefits
   a. Recipients receiving:
(1) Retirement benefits  
(2) Unemployment benefits  
(3) Workmen's compensation  
(4) Welfare subsidies  
(5) Food stamps  

b. Economic value of:  
(1) Retirement benefits  
(2) Unemployment benefits  
(3) Workmen's compensation  
(4) Welfare subsidies  
(5) Food stamps  

c. Funds raised for charities  

d. Services rendered by community organizations  

5. Law enforcement and fire protection  

a. Function and capability of:  
(1) Local police and sheriff's department  
(2) State and national law enforcement agencies  
(3) Correction and detention facilities  
(4) Judicial services  
(5) Fire department  
(6) Training facilities for law enforcement and fire protection  

b. Crime statistics  
(1) Criminal homicide  
(2) Forcible rape  
(3) Armed robbery  
(4) Aggravated assault  
(5) Larceny  
(6) Drunkenness  
(7) Disorderly conduct  
(8) Driving while intoxicated  
(9) Violation of liquor laws  
(10) Vagrancy  
(11) Violation of drug laws  

C9
(12) Violation of traffic regulations
(13) Participation in civil disorders

c. Other statistics
(1) Automobile accidents
(2) Automobile accidents involving at least one death
(3) Accidental deaths other than autc
(4) Suicides
(5) Practicing lawyers
(6) Firearms sold
(7) Bondsmen
(8) Calls answered by fire department
(9) Reasons for fires
(10) Number of deaths due to fires
(11) Public programs directed toward crime and fire prevention

6. Education
a. Characteristics of educational institutions
(1) Academic level (primary, secondary, college, etc.)
(2) Student enrollment
(3) Changes of enrollment
(4) Design enrollment
(5) Instructors
(6) Classrooms
(7) Social problems (ethnic, racial, etc.)
(8) Special training facilities
(9) Strong curricula offered
(10) Funds required for operation
b. Educational level of population (age, SIC, sex)
(1) Academic years completed
(2) Currently in school
(3) Illiteracy rate

7. Cultural resources
a. Facilities for cultural activities (libraries, museums, art galleries, theaters, historical and archeological sites, etc.)
b. Groups engaged in cultural activities (art associations, little theater groups, historical preservation societies, etc.)

c. Community events that focus public attention on local culture (or ethnic background)

d. General description of area's ethnic origins and philosophy

8. Recreation

a. Facilities suitable for spectator recreational events (football stadiums, race tracks, etc.)

b. Facilities suitable for participant recreation (golf courses, campgrounds, "tourist attractions," hiking trails, etc.)

c. Facilities where suspected or known illegal or questionable activities occur (gambling, prostitution, etc.)

d. Local recreational programs and events (high school football, little league baseball, annual fishing rodeo, etc.)

9. Community organizations

a. Objectives and activities of community organizations (Chamber of Commerce, Boy Scouts, Lions, Red Cross, etc.)

b. Effectiveness of organizations in meeting objectives

c. Benefit to community of organizational activities

10. Communications

a. Communications facilities (post offices, radio and TV stations, newspapers, telephone systems, telegraph offices, emergency communications centers)

b. Volume of mail handled by post offices

c. Coverage of radio and TV stations

d. Audience of radio and TV stations

e. Number of radios and TV's

f. Circulation of newspapers

g. Distribution area of newspapers

h. Telephones in use

i. Telephone calls handled

j. Monthly cost of telephone service
k. Messages handled by telegraph offices
l. Emergency communications capabilities

Economics

1. Personal income
   a. Income distribution (age, SIC, size, sex)
   b. Total income in impacted area
   c. Value to local economy
2. Economic statistics for commercial enterprises (agriculture, construction, fishing, manufacturing, mining, retail, services, transportation, utilities, etc.)
   a. Gross income
   b. Net income
   c. Payroll
   d. Value to local economy
3. Banks, savings and loan institutions, credit unions
   a. Total deposits
   b. Liquid assets
   c. Total assets
   d. Total liabilities
   e. Value to local economy
4. Educational institutions
   a. Funds required for operation
   b. Funds derived from public sources, private sources
   c. Payroll
   d. Value to local economy
5. Governments (city, county, township, state, national, etc.)
   a. Revenue (total, intergovernmental, property tax, sales tax, income tax, etc.)
   b. Expenditures (debt retirement, highway, education, public welfare, health, payroll, etc.)
   c. Value to local economy
   d. Tax rates (property, sales, state and local income tax)
e. Assessed valuation of real property (commercial, residential, etc.)

Earth Science

1. Topography
   a. Relief
   b. Microfeatures
   c. Erosion
   d. Aesthetic value

2. Soils and geology
   a. Classification of soils (USCS, AASHO, USDA, etc.)
   b. Physical description of soils (particle-size distribution, moisture content, permeability, strength, erodibility, etc.)
   c. Depth to bedrock
   d. Depth to water table
   e. Thicknesses of soil layers
   f. Classification of rock and glacial deposits
   g. Seismically active zones
   h. Geothermal sources
   i. Value potential (construction material, wildlife habitat, aesthetics, energy source, etc.)
   j. Response to cultural activities (agriculture, mining, construction, etc.)
   k. Local, state, and Federal legislation relevant to soil conservation and preservation of nonrenewable resources

Land Use

1. Areal land use classifications
   a. Agriculture
   b. Airports
   c. Archeological and historical sites
d. Barren

e. Commercial, institutional, government, and services

f. Estuaries, lakes, and reservoirs

g. Forests

h. Grasslands

i. Marshes and wetlands

j. Mining

k. Oil and gas fields

l. Permanent snow and ice fields

m. Recreational

n. Residential

o. Scenic

p. Waste disposal

q. Wildlife habitats

2. Easement land-use classifications

a. Cross-country electrical transmission lines

b. Cross-country gas pipelines

c. Highways and streets

d. Levees

e. Microwave links

f. Railroads

g. Streams (navigable)

h. Cross-country telephone lines

i. Cross-country water pipelines

3. Local, state, and Federal legislation relevant to land use

Noise

1. Sources (location, level, duration, repetitions, proximity to populated area, etc.)

2. Effects (physiological, psychological, communications, performance, social behavior, etc.)

3. Local, state, and Federal legislation relevant to noise control
Transportation

1. Terminals and links in transportation network (air, bus, truck, railroad, boat, etc.)
2. Traffic flow (vehicle, passenger, cargo)
3. Design criteria (life, capacity)

Aesthetics

1. Aesthetic characteristics that are unique to region that contains impact area
2. Description of area immediately adjacent to proposed activity site
3. Compatibility of existing architecture and landscape with proposed activity

Energy and Resource Conservation

1. Energy resources
   a. Sources of energy (oil, gas, and coal fields; dams with hydroelectric production capability; mines producing radioactive material suitable for reactor fuel; etc.)
   b. Active wells in oil and gas fields
   c. Barrels produced from oil fields
   d. Volume of gas produced from gas fields
   e. Mines in coal fields
   f. Volume of coal mined in coal fields
   g. Estimate of reserves in oil, coal, and gas fields
   h. Estimate of electrical energy available from hydroelectric facilities
   i. Estimate of potential energy available in mined radioactive material
2. Public utilities
   a. Electricity
      (1) Distribution system (generator stations, transmission grids, switch yards, etc.)
(2) Power used by consumers (commercial, residential, municipal, etc.)

(3) Unit cost to consumers; to other power grids

(4) Consumers using electricity

b. Gas

(1) Distribution system (gas fields, pipelines, pumping stations, distribution centers, storage capacity of system, losses due to leaks in system, etc.)

(2) Volume of gas used by consumers (commercial, residential, municipal, etc.)

(3) Unit cost to consumers

(4) Consumers using gas

c. Sewers

(1) Sewage system (pipelines, pumping stations, treatment plants, etc.)

(2) Volume of sewage processed (commercial, residential, municipal, etc.)

(3) Unit cost to consumers for sewage access

(4) Users of sewage systems
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