

12910

Coastal Zone  
Information  
Center

*W.P.*

COASTAL ZONE  
INFORMATION CENTER

# CHICAGO LAKEFRONT DEMONSTRATION PROJECT

## ENVIRONMENTAL IMPACT HANDBOOK

PREPARED

BY

ROY F. WESTON INC



AND

PETER C. RYNER

*Illinois City of Chicago Dept. of Development + Planning*

ILLINOIS COASTAL ZONE MANAGEMENT PROGRAM  
Marina City Office Building  
300 N. State Street Room 1010  
Chicago, Illinois 60610

CI  
MI  
M.  
TD  
194.66  
.132  
C55  
1977

CHICAGO  
LANDIC

DEPARTMENT OF DEVELOPMENT  
AND PLANNING  
LEWIS W. HILL  
COMMISSIONER

*Allman, City of Chicago Dept of Development and Planning  
TD 194.66.I32G55 1977*

# CHICAGO LAKEFRONT DEMONSTRATION PROJECT

## ENVIRONMENTAL IMPACT HANDBOOK

PREPARED  
BY



AND

PETER C. RYNER

LIBRARY

AUG 30 2005

National Oceanic & Atmospheric Administration  
U.S. Department of Commerce

The preparation of this document was financed in part by the National Oceanic and Atmospheric Administration, U.S. Department of Commerce under the Coastal Zone Management Act of 1972.

CITY OF CHICAGO  
MICHAEL A. BILANDIC  
MAYOR

DEPARTMENT OF DEVELOPMENT  
AND PLANNING  
LEWIS W. HILL  
COMMISSIONER

## TABLE OF CONTENTS

	<u>Page No.</u>
SECTION 1 - INTRODUCTION	1
1.1 PURPOSE OF HANDBOOK	1
1.2 THE ENVIRONMENTAL COMPLEXITIES OF LAKEFRONT EXPANSION	2
1.2.1 Historic Perspective	2
1.2.2 Environmental Regulations	2
1.2.3 Coastal Environments	3
1.2.4 Urban Setting	3
1.3 WHO WILL WANT LAKEFRONT ENVIRONMENT INFORMATION	4
1.3.1 National Environmental Policy Act	5
1.3.2 U.S. Army Corps of Engineers	5
1.3.3 Illinois Coastal Zone Management Program	7
1.3.4 The City of Chicago	7
1.3.5 Others Wanting Environmental Information	8
1.4 SUMMARY	8
1.5 CONCLUSION	9
SECTION 2 - ASSESSMENT STRATEGIES	10
2.1 WHEN SHOULD ENVIRONMENTAL ASSESSMENT BEGIN	10
2.2 FORMATION OF AN ENVIRONMENTAL ASSESSMENT TEAM	11
2.3 ESTABLISH PROJECT INFORMATION SYSTEM	12
2.4 FUNCTIONS OF ENVIRONMENTAL ASSESSMENT	13
2.5 SATISFACTION OF REGULATORY REQUIREMENTS	16
2.6 PUBLIC PARTICIPATION AND THE ASSESSMENT PROCESS	17
2.7 PRESENTING INFORMATION EFFECTIVELY	20
2.8 RETAINING PERSPECTIVE	22
SECTION 3 - ASSESSMENT TECHNIQUES	23
3.1 PRELIMINARY CONSIDERATIONS	23
3.1.1 The Qualities of a Good Assessment	23
3.1.2 Purpose of the Assessment	24
3.1.3 Establish Team	24
3.2 ASSESSMENT TOOLS	24
3.2.1 Specific Project Components	24
3.2.2 Change Vector Profiles	25
3.2.3 Impact Mapping	25
3.2.3.1 Prepare Base Maps	26
3.2.3.2 Prepare Environmental Assessment Overlays	26
3.2.3.3 Physically Locate Each Change Vector	27
3.2.3.4 Compare Change Vectors with Environmental Components	27
3.2.3.5 Develop Impact Network Diagrams	27
3.2.3.6 Evaluate Changes	27

OCLC: 4072963

Rec stat: c

Entered: 19780721

Replaced: 19950218

Used: 19950204

\$ Type: a Bib lvl: m Source: d Lang: eng  
 Repr: Enc lvl: I Conf pub: 0 Ctry: illu  
 Indx: 0 Mod rec: Govt pub: l Cont: bf  
 Desc: i Int lvl: Festschr: 0 Illus: bd  
 F/B: 0 Dat tp: s Dates: 1977, %

1388

\$ 1 040 IBF 'c IBF %

\$ 2 043 n-us-ill %

\$ 3 090 'b %

\$ 4 049 NQGM %

\$ 5 110 2 Roy F. Weston, inc. %

\$ 6 245 10 Chicago Lakefront Demonstration Project : 'b environmental

impact handbook / 'c prepared by Roy F. Weston, inc. and Peter C. Ryner. %

\$ 7 260 [Chicago] : 'b City of Chicago, Dept. of Development and

Planning, 'c [1977] %

\$ 8 300 ii, 73 p. : 'b diagrs., maps ; 'c 28 cm. %

\$ 9 504 Includes bibliographical references. %

\$ 10 610 10 Chicago. 'b Lakefront Demonstration Project. %

\$ 11 650 0 Waterfronts 'z Illinois 'z Chicago 'x Planning. %

\$ 12 650 0 Environmental impact statements 'x Handbooks, manuals, etc. %

\$ 13 650 0 Coastal zone management 'x Environmental aspects 'z Illinois 'z

Chicago. %

\$ 14 700 1 Ryner, Peter C., 'e joint author. %

\$ 15 710 1 Chicago (Ill.). 'b Dept. of Development and Planning %

SECTION 3 - ASSESSMENT TECHNIQUES (Continued)

3.3	INFORMATION SOURCES	28
3.3.1	Environmental Impact Statements	28
3.3.2	Transportation Noise and Its Control	28
3.3.3	A Specific Example	31
3.3.4	Further Information	35
3.3.5	Impact Network Diagram	35
3.3.6	Coastal Processes	37
3.3.7	Army Corps of Engineers Publications	37
3.3.8	Graphic Display of Information	38
3.3.9	Urban Systems	39
3.3.10	Public Attitude	39
3.3.12	Additional Sources	40
3.3.13	Methodologies	40
3.4	USING THE ASSESSMENT RESULTS	41

SECTION 4 - INTEGRATING ENVIRONMENTAL ASSESSMENT INTO THE PLANNING/DESIGN PROCESS 42

4.1	INTRODUCTION	42
4.2	PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT (PHASE I)	42
4.3	PHASE II ENVIRONMENTAL ASSESSMENT	45
4.3.1	Limiting the Number of Alternatives	45
4.3.2	Identifying Impacts of Alternatives	45
4.3.3	Utilize the Assessment Techniques Described in Section 3	46
4.3.4	Evaluate Impacts	46
4.4	REVIEW	47
4.5	SELECTION OF PREFERRED ALTERNATIVE	48
4.6	SUBMISSION OF FORMAL PERMIT REQUEST(S)	49
4.7	WHAT HAPPENS IF AN EIS IS REQUIRED	49
4.8	MONITORING PROJECTS	50

APPENDICES

APPENDIX A	CORPS OF ENGINEERS IMPACT ASSESSMENT GUIDELINES	52
APPENDIX B	TOPICAL AREAS OF CONCERN	62
APPENDIX C	PERMIT OR APPROVAL FACT SHEETS	70

## SECTION 1

### INTRODUCTION

#### 1.1 PURPOSE OF HANDBOOK

This handbook has been designed to serve as a guide in assessing the environmental effects of project developed in accordance with The Lakefront Plan of Chicago (1972). This handbook assumes that lakefront development has been identified by the City as being a potentially desirable activity and that there is a fairly clear idea as to what public objectives such development would hope to meet.

The Handbook presents a time-and cost-effective approach to environmental analysis that can improve the environmental soundness of the planning and design process; facilitate the granting of City and State permits; and lead to the submission of a clear, concise, and technically adequate Environmental Impact Assessment to the U.S. Army Corps of Engineers as part of their required permit application process.

In this document, four distinct terms receive frequent reference. Definition of these terms are provided below.

1. Planning Team - responsibility for developing the overall project plan; assures that the project conforms to the stated purposes and achieves the stated objectives composed of representatives of Federal, State and local and public interest groups.
2. Design Team - responsibility for developing the specific design of the project including landfill design, facilities configuration, and specific operation and maintenance requirements. Composed of experts in coastal processes, landfill design and construction, and social aspects of recreation.
3. Project Team - responsibility for day-to-day operations within the City's administrative structure. Composed of both staff and decision-makers employed by the City of Chicago.
4. Impact Assessment Team - responsibility for researching and writing the environmental assessment. Composed of city employees and outside consultants (as needed).

## 1.2 THE ENVIRONMENTAL COMPLEXITIES OF LAKEFRONT EXPANSION

### 1.2.1 Historic Perspective

The History of Chicago is one of man-made alterations to the waterfront. Swamps have been filled; artificial land created where once there was water; ports and docks constructed; canals dug; lake bottom dredged; and in the 1860's the flow of the Chicago River was reversed. The City's water edge has been heavily used, and has reflected the changing needs and interests of the City's economy and residents. However, the Chicago lakefront has also been protected and improved. As early as the 1830's parts of the Lakefront were designated for public open space. In 1890 Aaron Montgomery Ward filed suit to clear the lakefront along Michigan Avenue (now Grant Park) of objectionable structures and uses. The 1909 Daniel Burnham Plan indicated that everything possible should be done to enhance the attractiveness and natural beauties of the lakefront. He suggested the construction of a major new shoreline of beaches, lagoons islands, harbors, and cultural facilities dedicated to open space and public use. The 1972 Lakefront Plan of Chicago (and subsequent Lakefront Ordinance) restates in clear and strong language the importance of the lakefront to the people of Chicago, and the intention of the City to insure that any future development maintains and improves the present lakefront resources. Future lakefront development will have to consider not only the impacts of such development upon the waters of Lake Michigan and upon the adjacent communities, but also on the present Lakefront system and those who use it.

### 1.2.2 Environmental Regulations

There are Federal, State, and City statutory requirements which any lakefront project must adhere to:

- Federal Regulatory Authority - The U.S. Army Corps of Engineers has primary Federal authority over dredge or fill operations within the coastal zone. The Coast Guard, U.S. Fish and Wildlife Service, and the Environmental Protection Agency also have coastal authority which may apply to specific projects.
- State Authority - The Illinois EPA, the Division of Water Resources within the Department of Transportation, the Illinois Pollution Control Board, the Northeastern Illinois Planning Commission, and the Illinois Coastal Zone Management Program have some degree of authority over coastal activities. If the Illinois Coastal Zone Management Program is formally established, it will become the lead state agency to coordinate all permit requirements at the state level.

- City Authority - the Lakefront Plan of Chicago (1972) and the Lake Michigan and Chicago Lakefront Protection Ordinance (1973) are principal sources of authority and regulation for lakefront projects. There are other City regulations which may apply and need to be fully identified. The complexities of obtaining these permits in a timely fashion and successfully developing the necessary environmental information they may require indicates the need for a systematic and continuous process of environmental assessment.

### 1.2.3 Coastal Environments

Extension of the land into the nearshore environment has the potential of altering or creating new patterns of erosion, longshore and offshore transport, and deposition. Such projects can also affect water quality in a variety of parameters, such as temperature, dissolved oxygen, pH, or turbidity. The Chicago coastal zone contains complex patterns of shore and water use, including commercial navigation, recreational boating, swimming, residential development, public transportation, and commercial activities. Public regulation of this coastal area is shared by City, State and Federal authorities, although the Illinois Coastal Zone Management Program, if approved, would centralize and coordinate most coastal regulations. To undertake a major construction project within such a system is to necessitate a detailed evaluation of a great many potential environmental impacts.

### 1.2.4 Urban Setting

In engineering terms, the lakefront expansion would represent a large fill project and the establishment of open space/recreational facilities in addition to an in-place lakefront system. If constructed offshore or in a rural area, the primary environmental assessment might reasonably emphasize the potential impacts of such projects upon the physical coastal environment. However, this project is to be located at the edge of one of the world's largest cities and must incorporate those factors in the assessment. The social and physical dynamics of the City of Chicago are as complex as the biological, hydrological, geological, and chemical dynamics of Lake Michigan. There are several city and regional multi-million dollar planning and social services projects; major transportation systems; housing; sewer water and gas lines; an extensive lakefront recreational system; and millions of people with a wide variety of political and economic interests. The City of Chicago has several policies, programs, plans, and ordinances which must be adhered to. There are also certain procedures, standards, and social forces which represent a force as critical as offshore wave energy in determining the potential impact of lakefront expansion.



CONCEPT: The National Environmental Policy Act is specifically interested in the human environment, which includes social as well as physical parameters. The lakefront environmental assessment process should give attention to both if the project is to gain both public support and meet statutory requirements permissible under Federal law and acceptable under public opinion.

### 1.3 WHO WILL WANT LAKEFRONT ENVIRONMENTAL INFORMATION

One of the tasks of those responsible for environmental assessment of future Lakefront projects will be to determine the various audiences for environmental information, and to further determine what information they require, what form it should be in, and when it might be most effective. Burchell and Listokin, in The Environmental Impact Handbook, suggest that there are essentially three different audiences, each with somewhat different informational needs:

1. Agencies of government which must receive the assessment report because they require it as a part of processing or have jurisdiction over some aspect of its approval. An example for Lakefront projects would be the U.S. Army Corps of Engineers through its Section 10 and Section 404 permits.
2. Agencies of government which should receive the report because they can provide useful information which ought to be known as early as possible. This information may have an effect on future actions related to, if not directly controlling, the project's success. For Lakefront expansion, this might include the City transportation planning staff which could provide important information on assessment techniques and possible impacts even though they may have no direct regulatory authority over Lakefront expansions.
3. Private and quasi-public organizations and individuals with strong convictions and acknowledged interest in the type of project proposed, the project location, or potential impacts associated with project activities. For Lakefront projects the Lake Michigan Federation and Friends of the Parks are examples.

---

Source: Burchell and Listokin, pp. 37-38.

Section 2 of this Handbook and the Appendices provide specific information on regulatory requirements and strategies for organizing environmental information. A general indication of the types of environmental information which must be included in the assessment can be derived from the requirements of various regulatory agencies. A specific strategy for collecting and utilizing such information is presented in Section 2, but an overview of some of those requirements is contained here.

### 1.3.1 National Environmental Policy Act (NEPA)

NEPA has been the basis for most formal environmental assessment requirements by state and Federal agencies. Section 102(2)(c) of NEPA requires a statement for every major Federal action significantly affecting the quality of the human environment. It is possible that lakefront expansion projects will require a formal "102" environmental impact statement (EIS), and this is discussed further in Section 2. Generally, a Federal EIS as required by NEPA must describe:

1. The environmental impact of the proposed action.
2. Any adverse environmental effects which cannot be avoided should the proposal be implemented.
3. Alternatives to the proposed action (including no action).
4. The relationship between local short-term use of man's environment and the maintenance and enhancement of long-term productivity.
4. Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

### 1.3.2 U.S. Army Corps of Engineers

The Corps of Engineers must issue permits before any major lakefront construction could take place. Their authority to issue permits derives from two sources:

- Rivers and Harbors Act of 1899 (30 Stat. 1151-1153)  
Section 10 of this Act declares that Corps' approval is needed to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of any port, roadstead, haven, harbor, canal, lake harbor of refuge, or enclosure, or of the channel of any navigable water of the United States. The Corps must also approve the construction of any wharf, pier dolphin, boom, weir, breakwater, bulkhead, jetty or other structures beyond established bulkhead lines.

- Federal Water Pollution Control Act (P.L. 92-500)  
1972 amendments to this Act specify in Section 404  
that the Corps has authority to issue permits for  
the discharge of dredged or fill material into  
navigable waters. It is expected that further amend-  
ments to this important section of the Act will be  
made in late 1977 or early 1978.

The Corps of Engineers, in issuing Section 10 and Section 404 permits for future lakefront projects, will have to determine if a formal Federal Environmental Impact Statement is required. If such an EIS is required, then the City will have to provide information such as mentioned above. Even if a NEPA EIS is not required, the City must submit an Environmental Assessment to the Corps with its permit application. The content of this is discussed in the Appendices of this Handbook.

It is our experience that the City would benefit from treating the Corps' EIA requirement as if it were a Section 102 EIS requirement in terms of the amount and type of information that is required. The reasons for such a strategy are explained in Section 2. Each Federal agency has adopted its own EIA format. Since the Corps of Engineers will probably be the lead Federal agency for lakefront projects, there format would be followed by the City. The Corps in its EIA format seeks environmental information in nine general areas.

1. Project description.
2. Environmental setting without the project.
3. Relationship of the proposed action to land use plans.
4. Probable impact of the proposed action on the environment.
5. Any probable adverse environmental effects which cannot be avoided.
6. Alternatives to the proposed action (including no action).
7. The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity.
8. Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.
9. How the interests of regulatory agencies and the public have been considered during the development and design of the project.

Further information on these needs is contained in the Appendices.

### 1.3.3 Illinois Coastal Zone Management Program

It is unclear at this time as to the future status of the ICZMP. If formally established, this program will coordinate all state permits which a lakefront project may require. If established, the ICZMP will probably promulgate specific rules and regulations, including the format, type, and amount of environmental information that will be required to obtain necessary state permits. In the absence of a formal ICZMP, the Division of Water Resources within the Illinois Department of Transportation and the Illinois Pollution Control Board issue permits for Lake Michigan projects. The Illinois Revised Statutes, Ch. 19, Sec. 65 specifies that such permits are required prior to making any fill or deposit of rock, earth, sand, material, or refuse matter of any kind or description, or prior to the construction of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, causeway, arbor or watercraft mooring facilities or any building or structure of any kind within Lake Michigan.

### 1.3.4 The City of Chicago

Any lakefront project will require various City permits, such as building permits, and will also be required to meet various performance standards established by City ordinance, such as for noise. Environmental information will be required to obtain such permits. Also City Commissioners and personnel from other City Departments will need environmental information to understand what is being proposed, how it will affect City interests and what its "costs," including environmental considerations, will be. As mentioned in Section 2, it will be important to establish a clear identification of all standards and permit requirements as soon as possible, and from this derive a list of information needs that can be used in directing subsequent environmental assessment. Included within the web of City requirements and regulations, there are two especially important documents to consider.

- The Lakefront Plan of Chicago (1972)

The Lakefront Plan contains fourteen (14) basic policies for the Lakefront of Chicago, which were formally adopted by the City of Chicago in 1973. These goals are to guide development programs, and have direct implications for environmental assessment activities. The Assessment Team should review this plan because it provides a discussion of the intent and purpose of these policies.

- The Chicago Lakefront Protection Ordinance (1973)

As part of its development of a Lakefront Plan, the City of Chicago enacted a Lake Michigan and Chicago Lakefront Protection Ordinance in October of 1973. This ordinance not only contains policy guidance on environmental matters, but also includes procedural and informational requirements that are now law. Those undertaking an environmental assessment should be thoroughly familiar with the provisions of both the Plan and the Protection Ordinance.

### 1.3.5 Others Wanting Environmental Information

As stressed throughout this Handbook, environmental assessment should be an integral part of the design and planning process of any lakefront project. However, to accomplish this the Assessment Team must provide lakefront planners and designers with information when they need it in a form they can use. Also, it will be important to extract from them information that an environmental assessment will require and to make sure that they understand all of the environmental constraints upon their plans and designs that exist as a result of statutory requirements and public policy. Furthermore, the general public has long evidenced a considerable interest in the lakefront, and can be expected to evaluate any proposed alteration of the present system with great care and concern. Environmental impacts upon the social and physical systems of the Lake and the City will be of particular interest, and it will be politically and legally important to provide detailed environmental information that the public can understand and which addresses their concerns.

## 1.4 SUMMARY

Environmental assessment should begin at the initiation of a project, and influence planning and design decisions. To make sure that necessary environmental information is collected, and that there are no costly delays due to inadequate information or careless regard to various permit requirements, a systematic, comprehensive, and continuous assessment process is required. Once thought of as a final step prior to receiving necessary permits, environmental assessment has increasingly become an integral part of the entire planning and design process. Section 2 of this Handbook suggests how to organize an Environmental Assessment Team and several strategies for successful environmental assessment. Section 3 discusses the actual steps in an assessment, and Section 4 concludes with an overview of the lakefront planning and design process, and the various points in that process at which environmental assessment can be utilized.

## 1.5 CONCLUSION

In concluding this Section of the Handbook, it is useful to consider a description of the desired qualities of an environmental assessment which the U.S. Army Corps of Engineers has included in its manual entitled Preparation and Coordination of Environmental Statements. If this description is kept in mind throughout the environmental assessment process, the likelihood of developing an excellent EIA report, and of gaining project approval, will be greatly increased.

- A careful, objective detailing of environmental impacts, alternatives, and implications of a proposed project should give reviewers both within and outside the Corps insight into the particular trade-offs and commitments associated with the action.
- The general public, environmental action groups, trade and special interest associations, governmental agencies (and City Decisionmakers)...will all expect the statements to be a valid source of information on project effects, as well as a reflection of how the agency views environmental factors and seeks to accommodate them.
- Since the statements will be made available to the public and may receive broad exposure in the media, it can be assumed that they will receive careful scrutiny.
- Most importantly, preparation of the statements should cause systematic consideration of environmental impacts.
- An imaginative evaluation of alternatives and their implications should begin in the earliest stages of project formulation, with planners contemplating the criteria and range of information to be employed in preparation of final statements.

---

Source: P. C-1, Preparation and Coordination of Environmental Statements.  
U.S. Army Corps of Engineers, ER 1105-2-507, August, 1976

## SECTION 2

### ASSESSMENT STRATEGIES

#### 2.1 WHEN SHOULD ENVIRONMENTAL ASSESSMENT BEGIN

Environmental impact will be one of the limiting factors or constraints in the development of any future lakefront expansion. City interest, statutory limitations, and public opinion dictate that this be the case. Any "viable" alternative must be environmentally sound. The best way of developing a project that has minimum negative impact upon the human environment is to initiate environmental assessment at the start of project planning and design. U.S. Army Corps of Engineers guidelines for environmental assessment preparation emphasize this point.

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.

Source: Preparation and Coordination of Environmental Statements, U.S. Army Corps of Engineers, August, 1976. p. 10.

There are several specific reasons why assessment should begin at the outset of the project, rather than after planning and design are completed.

1. The adequacy of a formal EIS may in part be measured by examination of the process planning and design, and by which the formal EIS was prepared. This process could provide a framework for developing a "chain of evidence" to use in responding to questions about the environmental soundness of the project.
2. Gathering the amount and type of information required by City, State, and Federal permits takes a great deal of time, and can often be expensive. As a practical matter, there is never sufficient time, manpower or money to obtain as much information as might be desired. But this situation can be greatly improved if the information effort starts at the inception of a project. Such a strategy maximizes the amount of information that can be collected, improves the likelihood that such information can actually be utilized in the planning and design process, and improves the quality of permit applications.

For projects that involve as many factors and regulations as would a lakefront expansion, the fact is that an adequate permit application could not be prepared without considerable effort. Depending upon the manpower and money available, the necessary collection and development of environmental information might take from six months to several years. This will also depend upon the quality and type of information already existing. When new research is required, the preparation time is almost automatically extended into a significantly longer time frame.

CONCEPTS:

- Any complex water development project within a major urban area requires so much information that a permit application cannot be successfully submitted unless it is preceded by a well-designed continuous environmental assessment starting at the inception of the planning and design phase.
- Unless environmental assessment is an integral and continuous part of the planning and design process, important environmental considerations may be missed, and costly mistakes made.
- Unless environmental assessment is a major part of project development throughout the project history, then the project is vulnerable to challenge, especially if a formal EIS is required. Continuous environmental assessment is not only a pragmatic planning device; it is increasingly a requirement of law.

2.2 FORMATION OF AN ENVIRONMENTAL ASSESSMENT TEAM

Since public interest and statutory requirements have placed such great importance upon environmental information, it is necessary to develop a strong environmental assessment capability and to assign formal responsibility for assessment tasks to specific individuals within the design and planning team. It is our experience that two different types of team are required. The first, or Primary Assessment, would be directly responsible for the preparation of any formal impact assessments or environmental information preparations. The location of that team within City government and the specific membership remains a topic for City policy. However, this primary team should be small, and include individuals who have some demonstrated ability at general planning, rather than being confined by training or ability to just one narrow specialty. This generalist primary group should ideally have some specific set of skills, however. Burchell and Listokin, in The Environmental Impact Handbook, suggest that this team attempt to have representatives from economics, planning, architecture, engineering, sociology (or anthropology), law, the physical and biological sciences and public organizations. They conclude that at a minimum one physical or biological scientist; one planner, lawyer, or social scientist; and an architect, engineer, or other specialist drawn from the category most relevant to the project be included (see Pages 95-96 of their book for further discussion.)



In the real world of City planning, one takes what one can get. It is not likely that budget or personnel assignments will allow the formation of an idealized team of several members representing every relevant field. Thus, we suggest that the Primary Team, composed of generalists who have as good and diverse a background as possible, be augmented by the use of a Specialist Assessment Team that can be formulated on an as-needed basis from City personnel and outside consultants. This Specialist Team can help to identify research needs, evaluate the adequacy of the assessment process, and help in developing specific impact descriptions. Membership for the Primary Team should be drawn from City Personnel, and the assessment process that will take place can and should function as a communication device between various City Departments responsible for aspects of the Lakefront project development and approval. Every major City agency that has significant responsibility for the project should be involved in the assessment, either by membership on one of the assessment teams, or through a series of formal or informal "in-house" meetings which solicit their input and keep them informed of project and assessment progress.

In some instances, such as for wave energy studies or the mapping of littoral cells, outside technical assistance may be required. Whenever possible, assistance should be sought from public agencies with the requisite expertise; especially potential reviewing agencies. Not only can this reduce costs; it can also expand the City's knowledge gained from inter-agency cooperation, and increase outside understanding of the City assessment program. Such initial communication and understanding may speed the permit process. When a reviewing agency is suddenly handed a complex project permit request without prior exposure to the project, a considerable amount of time may be required for that agency to gain sufficient background to make a judgment. Such delays can be avoided by including those agencies in appropriate ways throughout the assessment process.

### 2.3 ESTABLISH PROJECT INFORMATION SYSTEM

It can be expected that for major Lakefront projects the assessment team will collect and distribute a considerable amount of information. It is important to establish a formal information system as soon as possible, so that information can be retrieved rapidly; so that it is always clear as to what information is at hand, what information is being collected, and what information remains unknown.

1. This information system should contain collection of slides, charts, graphs, sketches, photographs, and other graphic materials that can be utilized by the Assessment Team in formal environmental assessment presentations.

2. One of the first starting points would be to collect, organize, and study the material that has been prepared during the Lakefront Demonstration Project. PERT analysis, a Cost-Benefit Handbook, this Environmental Analysis Handbook, primarily identification of possible impacts, Design Workshops, and an Environmental Information Directory are key products of the Demonstration Project.
3. The Lakefront Plan of Chicago, and the Lakefront ordinance should be studied. Any supportive materials should be collected and added to the assessment information system.
4. Recent Permit applications and Environmental Impact Statements prepared by the City of Chicago, the U.S. Army Corps of Engineers, or related to similar types of projects should be collected and reviewed. They often contain useful citations; clarifications of regulatory requirements; additional impact profiles; new mitigation techniques; or improved methods of preparing an impact assessment document.
5. As part of its information collection effort, the Assessment Team should prepare, maintain and revise a Lakefront Project Regulations Manual which contains a copy of every relevant law and associated regulation, copies of actual permit application forms, and any permit or impact assessment preparation directives which various agencies may have prepared.

All of this information should be constantly updated. Frequent reference to the Federal Register, to newsletters such as Land Use Planning Reports and Coastal Zone Management News, and the City personnel in other Departments will assist in keeping this system up to date. This collection necessary for the systematic gathering and utilization of environmental assessment data, may be of considerable assistance to planners and designers associated with the project. If properly organized and maintained, it can greatly facilitate the preparation of any required impact assessments and lead to significant time and cost reductions in the permit process.

#### 2.4 FUNCTIONS OF ENVIRONMENTAL ASSESSMENT

In determining what types of information to collect, what types of research to sponsor or undertake, and what investments of limited time, money, and manpower to make, it is useful to consider the various functions that environmental assessment information might fulfill.

1. Regulatory Function - In Section 1, reference was made to informational requirements of (a) The National Environmental Policy Act (NEPA); (b) The U.S. Army Corps of Engineers; (c) the Illinois Coastal Zone Management Program (Illinois Department of Transportation); and, (d) the City of Chicago. In the next part of this section, strategies for satisfying regulatory requirements are presented. Of importance here is that the various permits, standards, policies, and procedures established by law at the City, State, and National level represent a specific set of informational requirements which the Assessment Team must fulfill. When environmental assessment first was incorporated within the public planning process, especially after the passage of NEPA and subsequent environmental legislation, fulfilling these regulatory requirements was often perceived as being the only function of environmental assessment. For that reason, assessment was often undertaken by one or more individuals not associated with the planning and design process, after the project was completed. To understand why this procedure is not sufficient and why it is not as common as before, it is important to consider the other functions of environmental assessment.
  
2. Planning/Design Function - It is beyond the scope of this Handbook to describe a planning and a design process for Lakefront projects. In general terms, the planning and design of a lakefront project of the type proposed in The Lakefront Plan of Chicago (1972) require sophisticated environmental information if they are to work. Environmental information is a basic ingredient in such projects, and includes not only physical information, but also extensive social information related to the human environment of the City and of Lakefront and Lake Michigan water use. Thus, if no environmental assessment were required in order to obtain City, State, and Federal permits, City planners and designers would still need environmental information in order to achieve a workable "fit" between the present City/Lakefront/Lake Michigan system and new Lakefront extensions. To fulfill these needs, the assessment Team should include planning and design personnel, and should work closely with those responsible for the actual designing and planning. The relationship is one of mutual cooperation, with the Assessment Team providing planners and designers with information on legal requirements and basic environmental data, and the planners and designers providing the Assessment Team with planning and design factors that may impact the human environment.

CONCEPT: This is the most important function of the Assessment Team. The measure of a good environmental assessment effort is not a good environmental impact statement. The true measure lies with the development of a cost-effective and environmentally-sound Lakefront project which has minimum impacts upon the social and physical parameters of the Chicago region.

A close working relationship with project planners and designers will do more than enhance the environmental soundness of the resulting project proposal. It will also greatly facilitate the preparation of required environmental statements, by providing the Assessment Team all of the information it requires to describe the project, the site, proposed alternatives, possible mitigation techniques, and the various factors that went into the decision process. If carefully coordinated, excellent permit applications can be completed shortly after a preferred project proposal is adopted by decision-makers.

3. Information Function - It is important to keep in mind that there can be a significant difference between an adequate environmental assessment and approval of a Lakefront project. The decision of whether or not to undertake any Lakefront project will be a social choice, reflecting the interests and concerns of a wide variety of groups at the City, State and Federal level. While the regulatory framework affecting any Lakefront project is large and complex, only a limited number of formal permit requests and environmental assessments are required. However, once these are prepared, they will probably be scrutinized by a large number of people representing several interest groups. These people may not have permit authority; but they may have several legitimate concerns, and they often have the power, if not the authority, to alter, delay, or prevent the implementation of a Lakefront project. It is important that they be provided with credible information that they can understand, that answers their concerns.

Also, as part of the City planning and design process, the environmental Assessment Team has an information responsibility to other City Departments and to the City Decisionmakers. City Decisionmakers need information with which they can

formulate policy and allocate funds and manpower. They also need information to respond to public concern; to explain what is being proposed, the manner in which it is being planned, and what its benefits and costs will be to City residents. This may require the storage and preparation of environmental information in quite different format than for regulatory agencies or the general public, and the Assessment Team should have this in mind when establishing its information system and developing its environmental assessment.

## 2.5 SATISFACTION OF REGULATORY REQUIREMENTS

The Lakefront Plan of Chicago cannot be implemented if necessary permits cannot be obtained or statutory standards met. This is a "bottom line" consideration that defines the basic difficulties and responsibilities of the Assessment Team. As described above, the Assessment Team has a two-fold responsibility: (1) to adequately assess environmental impacts so as to meet regulatory requirements, and (2) to effectively interface with planners and designers to insure that proposed projects are environmentally sound. Given the complexities of planning and designing Lakefront projects, and the regulatory matrix of City, State, and Federal requirements which may apply, the Assessment Team must use a systematic approach to regulatory requirements if it is to succeed. An uncomplicated but effective approach is presented here for Assessment Team consideration.

1. Identify Regulatory Requirements: Prepare a Lakefront Project Regulation manual that contains copies of all pertinent laws, regulations, standards, policies, and procedures. Obtain copies of actual permit application forms, as well as copies of recent environmental assessments and approved permits.
2. Formulate a flow diagram: Using the material within the Regulation manual, determine the specific information that will be required for each permit. Also identify probable permit processing times and at what stage in project planning and design they may be required.
3. Follow a formal assessment process: Section 3 of the Handbook presents a suggested approach to actual assessment of a project. As assessment takes place, identify information needs, time and money required to meet those needs, and then incorporate that information into the flow diagram so as to have a detailed investment strategy of research time, manpower, and money.

4. Contact Regulatory Agency Personnel: Contact with people responsible for permit review can be of great assistance to the assessment process. These contacts can provide updates on formal requirements, initial indications of areas of particular concern, and examples of "good" and "bad" permit applications. Basic data may be available, along with research assistance in the form of sources, money, equipment, or personnel. While some agencies may resist contact prior to permit application, most will welcome such contact.

CONCEPT: If the environmental assessment is organized and managed properly, every major impact will have been identified by the time of permit request, and major regulatory agency concerns will have been identified and addressed in the material accompanying the permit application. The dialog between the city and regulatory agencies should not start at the time of permit application. By that stage, the permit application should reflect a continuing communications process and an adjustment of project planning and design to reflect regulatory concerns, to the degree possible.

These steps, combined with the assessment process outlined in Section 3 should lead to a successful permit application.

## 2.6 PUBLIC PARTICIPATION AND THE ASSESSMENT PROCESS

There are at least two schools of thought regarding when and how citizens should participate in the environmental assessment process. The differences result in part from basic philosophies as to the purpose and utility of public input. Perhaps of even greater importance is the consideration of how to prepare the best assessment in the shortest time and at the least cost. Ultimately, decisions as to when and how to involve the public in Lakefront project planning involves consideration beyond the assessment process. Benefit-cost analysis, project planning, and design work is also part of the project, and questions arise as to when and if the general public should be involved in those processes. These decisions can affect the ability of the project team to accomplish its tasks in a timely and cost-effective manner. These decisions can also influence the degree of public understanding of and support for project proposals. These are policy decisions that will have to be made at the appropriate time. It is useful to consider the two basic alternatives and how each might affect the assessment process.

1. Early and continuous citizen input - It has been suggested by more than one commentor that citizen input to the assessment process should begin as soon as possible. It has even been suggested that one or more citizen representatives be included as a member of the Assessment Team. The argument for such involvement is two-fold. First, it is perceived by those who advocate maximum citizens involvement that many of the human environmental impacts are not easily quantified or identified by analytic techniques; that they are often subjective reaction to particular proposals and that they can only be detected by obtaining public input as early as possible. The other argument is that citizens may object to a project and perhaps even delay or prevent its implementation. By including citizens in the assessment process, the assessment will not only be more complete, but better understood, and hopefully more acceptable to the public as a result of their input.
  
2. Citizen Review after Specific Alternatives have been Developed - As an alternative strategy, some advocate a relatively closed initial assessment, planning, and design process that utilizes City personnel, expert consultants, and City officials. Advocates of this approach suggest that citizen input is "counter-productive" until specific proposals have been formulated and detailed environmental analysis undertaken. They point out that this process does not preclude citizen involvement in the decision process, but delays extensive public discussion until there is something specific to discuss. Citizens are represented by elected officials who oversee the planning and design process, and through public discussion, permit procedures, and City decisions, have full opportunity to influence the decision process.

Citizen participation in the assessment, design, and planning process could easily occupy the contents of an entire Handbook in and of itself. The actual type, degree, and timing of citizen input will of necessity be a City policy decision that cannot be prescribed in this Handbook. However, examples of some of the many strategy concepts available to the assessment team include:

1. As part of its information system, the assessment team should develop a file on Citizen Concerns. These are part of the social and physical impacts which the assessment will have to deal with, and which the project will have to satisfy.

2. Much information can be gathered by reviewing past newspaper and magazine articles. A file of these should be maintained.
3. City officials are a direct linkage with the general public, and a structured mechanism should be developed to not only keep them informed of the project, but to gain their input as to public concerns.
4. Other City Departments with recent projects in the neighborhoods to be affected, or with projects related to the Lakefront or Lake Michigan can identify public concerns.
5. It is suggested that at some point a public information meeting be held to review the findings of the Demonstration Project, and to seek comment and review.
6. When and if a specific project is undertaken, a newsletter might be established as part of the planning process. A mailing list could be developed so as to provide continuous information to other City Departments, City officials, the news media, and the general public, as well as the various City, State, and Federal agencies with regulatory authority over the project.
7. When and if a specific project is initiated, there should be frequent public informational meetings, describing what is about to happen, what impacts are expected, what precautions have been taken. Field trips to the project site could be arranged.
8. Special meetings should be held with residents of the neighborhoods adjacent to any project. Businessmen, institutions, special populations, and residents will have problems, concerns, and suggestions that should be addressed in a direct and timely fashion. All such contacts should be recorded, kept in the Assessment Information System, and presented to appropriate City officials.
9. When a specific set of design alternatives have been formulated as described in Section 4, then a public information meeting or series of meetings should be held. Public displays may be appropriate. An informational slide show and publication will be useful to describe the proposed alternatives, the impact assessment, and the planning and design process that went into their formulation.



10. When public input has been obtained from these meetings, then the planning and design team should meet with the assessment team and evaluate not only all of the other factors influencing project design, but also the specific input from the public meetings. Any significant public concern that is not fully resolved through project modification should nonetheless be discussed, and a formal City response developed.
11. When a preferred alternative has been chosen and a draft assessment prepared, another set of public meetings should be held for review and comment. The utility of all such meetings can be greatly increased through careful preparation. These meetings should be fully recorded, and all significant concerns addressed either with project modifications or some explanation.
12. The final assessment submitted to various agencies for permit approval, especially to the Corps of Engineers, should contain a full description of these meetings, of public concerns which emerged, and of actions taken to satisfy those concerns.
13. Prior to submittal of permit requests and final assessments, the assessment team should review the public participation efforts of the program and the input which resulted to the appropriate City Decisionmakers, including the City Commissioners. A clear disclosure of all public concerns should be made, and precise and clear explanations given as to what response has been given to each of those concerns. It is important for the assessment team to remember that a determination of adequacy of the assessment process and of its public participation component is in large part a political and policy decision beyond the preview of the assessment team. If the need for this final presentation is kept in mind as public participation efforts are taking place, then the information generated can be properly recorded so as to facilitate later use in planning, design, and policy evaluation.

## 2.7 PRESENTING INFORMATION EFFECTIVELY

The best information is worthless unless it can be used. That is why so much attention should be given at the outset as to what types of environmental information will be required for what purposes at what times. In most instances, there will be very little time to prepare

unorganized information into specific informational products, and the communications function of the assessment team will be difficult to fulfill unless information delivery is planned and designed on a continuous basis. Following are some specific concepts which may assist in this communications function:

1. Collect graphics and graphic ideas as the assessment is carried out, always keeping in mind the various audiences and information needs that the assessment results will have to attempt to satisfy.
2. Study other EIA's and EIS's. The City of Chicago has prepared some excellent documents. Various agencies can provide copies of documents they have received or prepared. Each Friday, the Federal Register lists new EIS's that are available for comment and review, and a sample of these should be evaluated for graphic ideas. The intent is to obtain from other sources good ideas on how to present various types of information.
3. Use caution in the utilization of graphics. Do not use graphic material unless it can actually clarify material. If too much emphasis is placed upon graphics criticism may result from having spent too much money, or someone may charge that there is too much "eyewash" and not enough substance. Most impact assessments are deficient in the creative use of graphics. But too much graphic material or irrelevant illustrations can distract from the substantive quality of the product.
4. When describing various impact vectors, use quantitative descriptors whenever possible. Take great care in describing the product, the setting, or projected impacts. Do not use phrases such as "minimal effect" or "significant amounts of." In most instances the language of the assessment should allow any reviewer to understand what is being proposed and what may result from the implementation of that proposal. Determining whether or not some vector is "insignificant," "minimal," "major," "good," or "bad" is the ultimate objective of project review. The assessment is supposed to provide the basis by which any reviewer can make an independent determination as to the appropriate characterization of those impacts.

## 2.8 RETAINING PERSPECTIVE

It is important to remember that a good environmental assessment is no guarantee of speedy processing of permit requests, nor can it guarantee project approval, either by regulatory agencies or by the general public. Environmental factors are certainly constraints, but they are not the only constraints which face the City, the State, and various Federal agencies. Approval of a lakefront project will involve social choices that combine subjective and objective information and an evaluation of politics, economics, manpower, alternative priorities, and a host of additional factors. It will be important for the assessment team to understand these other decision factors. The assessment must be prepared in an objective manner and it will be up to others, outside of the assessment team, to determine the ultimate merits of environmental considerations.

## SECTION 3

### ASSESSMENT TECHNIQUES

#### 3.1 PRELIMINARY CONSIDERATIONS

Prior to discussing the technical aspects of environmental assessment, it is important to review some of the material that has been presented in earlier chapters.

##### 3.1.1 The Qualities of a Good Assessment

Section 1 concluded with an Army Corps of Engineers' description of desirable qualities of an assessment. It is repeated here, as a reminder of what the assessment team is attempting to accomplish.

- A careful, objective detailing of environmental impacts, alternatives, and implications of a proposed project should give reviewers both within and outside the Corps insight into the particular trade-offs and commitments associated with the action.
- The general public, environmental action groups, trade and special interest associations, governmental agencies (and City Decisionmakers)...will all expect the statements to be a valid source of information on project effects, as well as reflection of how the agency views environmental factors and seeks to accommodate them.
- Since the statements will be made available to the public and may receive broad exposure in the media, it can be assumed that they will receive careful scrutiny.
- Most importantly, preparation of the statements should cause systematic consideration of environmental impacts.
- An imaginative evaluation of alternatives and their implications should begin in the earliest states of project formulation, with planners contemplating the criteria and range of information to be employed in preparation of final statements.

---

Source: Preparation and Coordination of Environmental Statements, Page C-1.

### 3.1.2 Purpose of the Assessment

The Assessment Team should review the discussion in Section II of the various functions of an environmental assessment. The Regulatory Function, the Planning/Design Function, and the Information Function each suggest a somewhat different approach to the assessment process. The amount of time and money spent on the assessment; the degree and type of information to be prepared; and the manner in which the assessment is to be presented may differ for each assessment, depending upon the purpose it is to fulfill.

### 3.1.3 Establish Team

Section 2 describes the assessment team concept. Once the team is established, and a budget assigned, the team should prepare a Lakefront Regulation Manual and an Assessment Information System, as described in Section 2. An initial set of coordination meetings should be held with planners, designers, and representatives of City, State, and Federal regulatory agencies having jurisdiction over the project. This should be done to gather initial information and to establish lines of communication. Once this has been done, the assessment can begin.

## 3.2 ASSESSMENT TOOLS

The Assessment Team requires some method to systematically evaluate every aspect of a project in order to determine what impacts may occur at various stages of the project; and in order to accurately determine the cumulative impacts of the project as a whole. There are certain tools and concepts which can facilitate impact identification. These include specific project components, change vector profiles, and impact maps.

### 3.2.1 Specific Project Components

The construction and operation of lakefront projects can be defined in terms of project components. Such components may be placement of fill material, dredging of sand for beach formation early in the construction cycle or landscaping, and facilities placement near the end of construction.

It is desirable to generate such a list because it promotes a thorough understanding of what the project involves. Also, such a listing is useful to the Assessment Team because it helps them identify those things that will or may generate impacts.

The generation of the list is a useful exercise even of itself because it promotes a thorough understanding of what the project involves. Therefore, it is important to have the entire project team involved in the initial development of the list. This would also ensure that the list which is generated is both comprehensive and coherent.

At the beginning of the project, before any actual designs are generated, the listing will be extremely general. For example, transportation and implacement of fill materials, surface preparation, utilities connections, and recreation usage would qualify as project components at this early stage. As the project develops and alternative designs emerge, these components can be described in greater detail. They should be described in spacial and temporal dimensions; indicating what is going to occur where and when. These components can then be organized into a sequential network of activities. Each of which may cause changes in the existent, social or physical environment. It is this activity network that facilitates the comprehensive evaluation of all aspects of the project from construction through operation.

### 3.2.2 Change Vector Profiles

Once the project has been translated into specific project components, each part of the network can be evaluated in terms of its potential for causing impact. It is necessary to identify how each component may change the social or physical environment. The Project Component may introduce some new stimuli or element that was not present before development took place. The Project Component may increase or decrease ambient conditions. Or a Component may eliminate an existing condition.

As an example, if the project Component is dredging, the changes that may result include sediment entrainment, removal of bottom organisms, or topographic alteration. If the Component is the passage of heavy equipment through residential neighborhoods, changes might include noise, vibration, fumes, and increased congestion of vehicular traffic.

It can be seen that the assessment process is a series of translations. First a project, such as a Lakefront extension, is broken down into discrete elements. Then these elements or components are translated into changes which each component will or may induce. As the project alternatives become more specific, these change factors or vectors can be described more precisely, indicating the intensity, duration, and location as well as other appropriate characteristics. It is profiling of change vector which will allow an identification of environmental impacts, as these vectors are compared with components of the activity arena, or the social and physical environment. This comparison, leading to the identification of impact potentials, can be facilitated through the use of maps.

### 3.2.3 Impact Mapping

Once a project has been translated into a series of change vectors, it becomes possible to systematically compare project components with environmental components in order to assess the probable degree of fit or conflict between the existing conditions and project-induced change. The following steps suggest one rather inexpensive and easy method of doing this, especially at the early stages of assessment.

3.2.3.1 Prepare Base Maps. The Planning and Design teams will also need maps, so an agreement should be made, when and if possible, as to Overall project mapping. The scale, amount and type of information to be included on the base map, and who is going to prepare them should all be agreed upon at early planning meetings.

3.2.3.2 Prepare Environmental Assessment Overlays. Once base maps are available, the Assessment Team should start to record the social and physical characteristics of the project area to acetate overlays. Assistance from designers would be useful here. The types of environmental components to record might include current patterns, bathymetry, geomorphology, shipping lanes, recreational boating patterns, temperature gradients, ambient air quality, ambient noise levels, pedestrian and vehicular patterns, City zoning, existent patterns of use, population densities, special populations, etc. The Design Workshop information and the Environmental Information Directory produced during the Lakefront Demonstration Project should be consulted for initial information.

CONCEPT: Judgment will be a critical part of the assessment process. In determining where to start; what research to undertake; and when a proposed alternative is sufficiently unsound, environmentally, so as to warrant abandonment... these will all require judgment.

When preparing map overlays, judgment will have to be used in deciding which information is important, and what degree of detail is necessary. Remember that unless using very large maps and often expensive mapping techniques, that mapping is a useful, but general tool. When precise measurements are needed, site analysis may be more appropriate.

Keep in mind the various purposes of the assessment process. The Army Corps of Engineers may not require the same degree of detail in some areas as the State of Illinois, or City Decisionmakers. Since the Assessment Team must meet the environmental information needs of many different groups, it is best to err on the side of too much detail at first, especially when undertaking a broad overview of possible impacts. By the time the Assessment Team is into Phase II Analysis, as discussed further in this section, then the area of study and the factors considered can be more rationally narrowed. By using grease pencils and acetate overlays during this first process of evaluation pragmatic considerations of cost and time can be met.

3.2.3.3 Physically Locate Each Change Vector. Taking the Change Vector Profiles, trace out on acetate overlays the location or pathway of each project component. The routes of barges of heavy equipment; parking locations of project workers; and patterns of noise generated by construction equipment can all be placed on map overlays. Some change vectors may defy efforts at mapping, but it is an effective starting point.

3.2.3.4 Compare Change Vectors with Environmental Components. The actual changes that will occur within the social and physical environment of the project area depends upon the vectors of change which the project generated and upon the sensitivities of the environmental elements which are exposed to those vectors. If the base map with its environmental component overlays is now combined with the graphic mapping of the physical pathways of the change vectors, an initial picture can be obtained of how the environment and the project interact. At this point the Assessment Team will have a visual display of project/environment interactions.

3.2.3.5 Develop Impact Network Diagrams. The next step in this assessment technique is to prepare a diagram of each interaction, describing how the change vector will affect specific components of the human environment at specific times and places. If the map indicates that heavy equipment will generate a noise pathway of 85 dBA through a residential street, the network would trace out the projected duration and reaction of that noise. Initial changes may lead to important secondary and tertiary changes. This chain of events can be compared with other impact chains and eventually an entire impact network developed.

3.2.3.6 Evaluate Changes. If this initial assessment indicates that there will be changes in the human environment, it then becomes necessary to go through the evaluation process described further, and depending upon the results of that evaluation, either record why the change is within acceptable parameters or else interact with the planning and design groups to either modify the project or develop mitigating strategies.

#### The Importance of Time

As project components become more specific, it will be increasingly necessary to pay particular attention to the temporal dimensions of both the change vectors and the environmental components with which the vectors will interact. In coastal areas and in urban centers, both of which will be involved in a Lakefront project, time is a critical factor. Whether or not an impact will occur, and whether or not a potential change represents a significant problem often depends upon when that change vector appears (time of day, time of week, time of month, time of year, etc.) or how long it lasts (seconds, minutes, hours, days, weeks, months, etc.).



Noise generated by construction equipment may have more impact upon an adjacent residential community if it takes place during the night rather than during the day. During cold weather, increased turbidity from fill activities would have less, if any short run impact upon adjacent recreational uses of the water.

CONCEPT: Natural Systems and human activities often occur in cycles. If the project can be orchestrated so as to interact with the social and physical systems of the project area when these cycles are least sensitive to disruption. Then project impacts can be minimized.

### 3.3 INFORMATION SOURCES

#### 3.3.1 Environmental Impact Statements

For those unfamiliar with environmental assessment, especially associated with large projects, the above technique may appear to be rather complex. However, it is a technique used in many present Environmental Impact Statements. It is one of the most pragmatic and easy approaches to use. As suggested in Section II, the Assessment Team should collect Environmental Impact Statements as part of its Assessment Information System. The application of methodology to specific projects and specific sites can be evaluated through these EIS's, which are available free from the issuing agencies. Each Friday, the Federal Registrar lists new EIS's available for review. Plus City Departments and State agencies prepare EIS's as part of their planning, especially in the areas of housing and transportation. The Army Corps of Engineers prepares its own assessments, and also reviews those of others seeking Corps permits. There is an extensive body of literature represented by these EIS's, and since they are free, there is no excuse for not developing a collection of them.

#### 3.3.2 Transportation Noise and Its Control

U.S. Department of Transportation  
U.S.G.P.O. No. 5000-0057, 1972

This specific publication should be obtained for addition to the Assessment Information System. It contains a useful introductory bibliography of other sources on noise management that will be of use. And it provides a clear introduction to transportation noise and how to control it. But of particular interest are the diagrams contained on Pages 7 and 25 of that publication and reproduced here. As can be seen from these diagrams, many activities can be graphically described in terms of their change vectors, such as noise. Even when the exact dimensions of these vectors cannot be determined with precision, it is often possible to graphically display areas that may have impact problems and which need detailed research and evaluation.

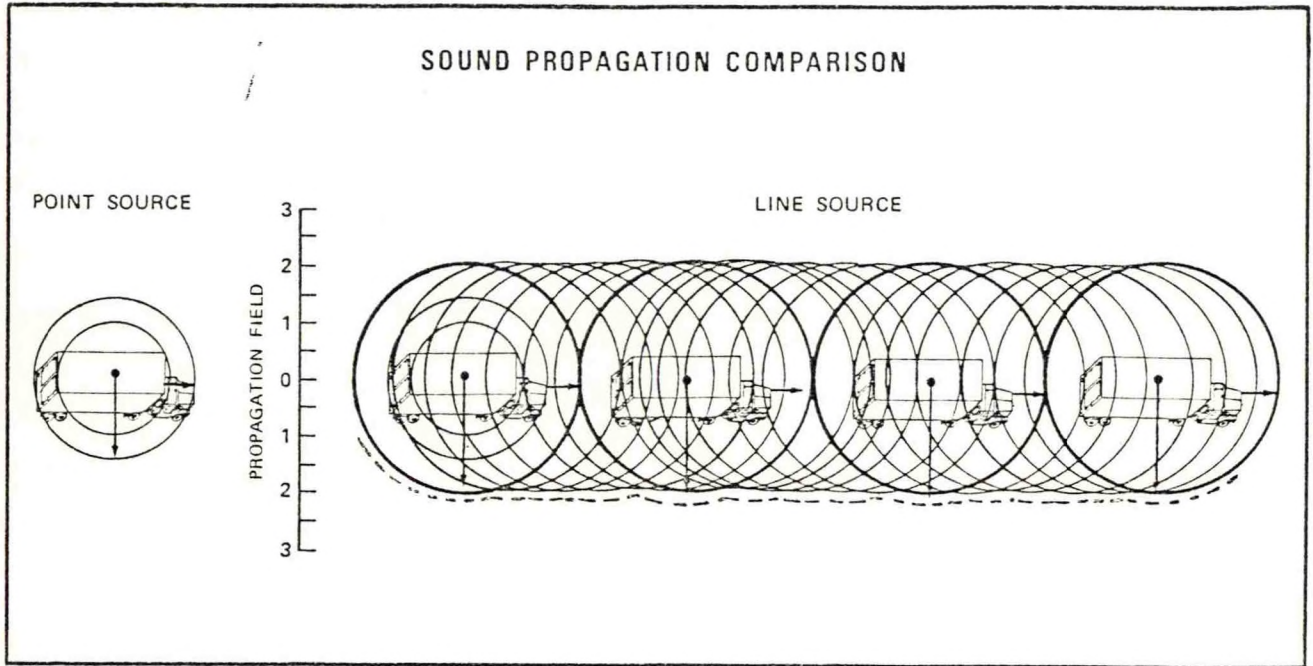
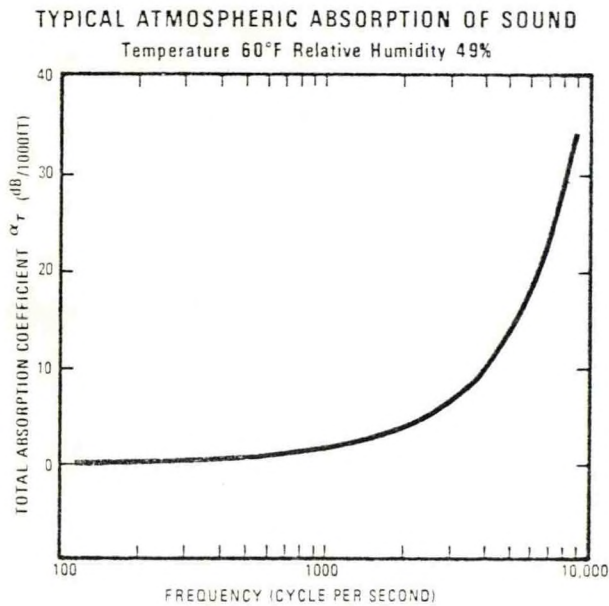


Figure B-1.



#### ATMOSPHERIC ATTENUATION

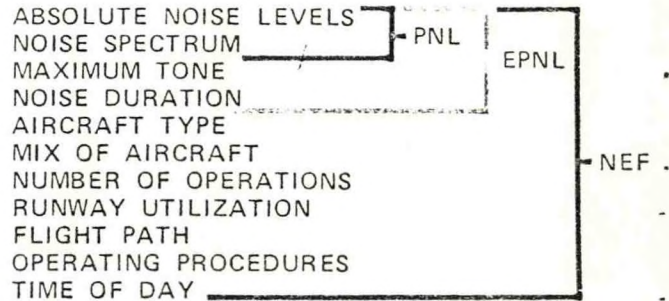
In addition to the geometric attenuation, sound undergoes a loss in energy as the wave spreads through the atmosphere. This energy loss is due to atmospheric absorption. The magnitude of the absorption depends basically on the temperature, relative humidity, and most importantly the frequency of the sound. Figure B-1 shows the atmospheric absorption at 60° F. and 49 percent relative humidity, as a function of frequency.

Total sound reduction is obtained by the arithmetic addition of the geometric attenuation and atmospheric absorption, and by accounting for the effects of shielding that may be in the path of the sound wave.

Source: Transportation Noise and its Control, p.25

### NOISE EXPOSURE FORECAST (NEF)

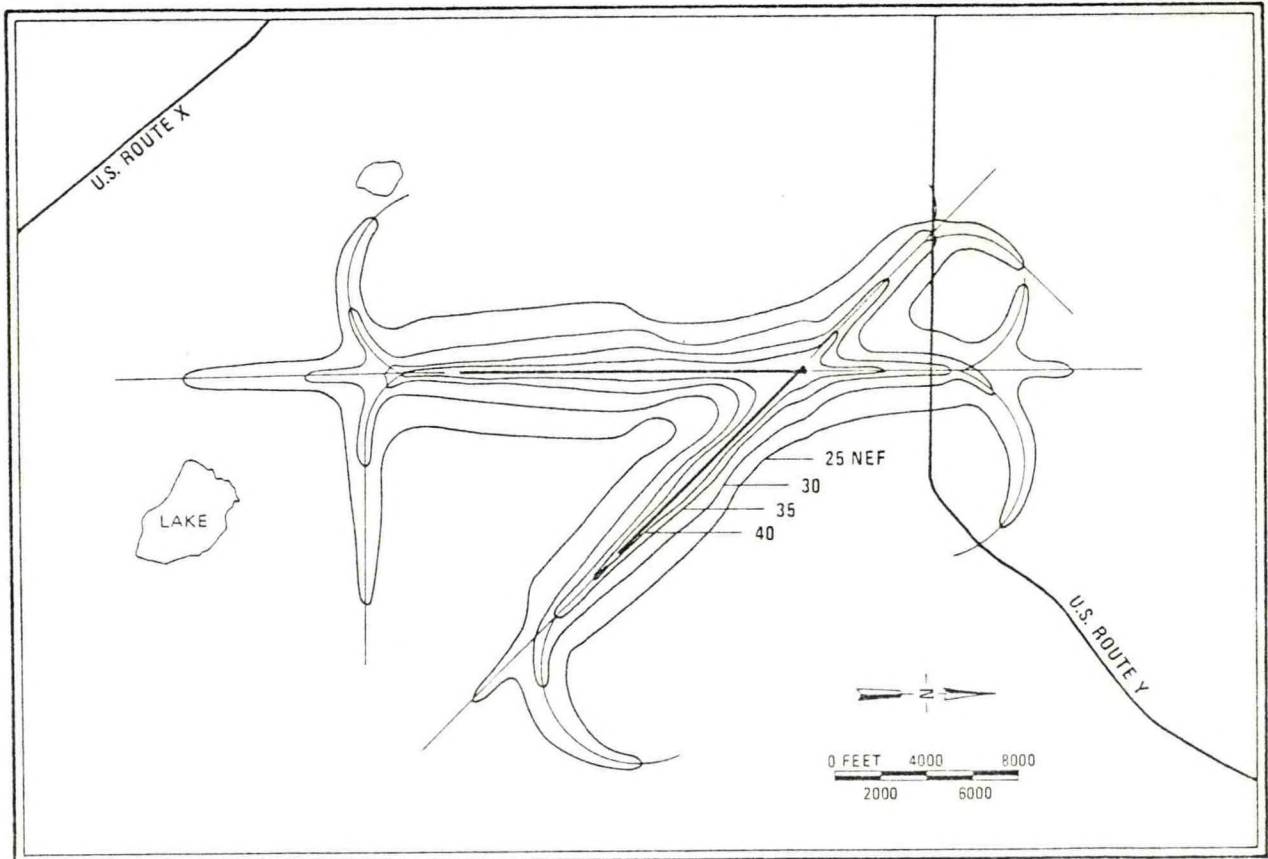
The Federal Aviation Administration has developed a methodology to produce Noise Exposure Forecasts (NEF's) to assist land-use planners in defining the areas adjacent to airports that are exposed to the highest cumulative noise from aircraft operations. This methodology begins with the noise exposure from a single aircraft flyover expressed in Effective Perceived Noise Level (see Appendix A) and combines it with frequency of occurrence, time of day, and the aircraft track and flight profile. The various factors necessary for developing each of the noise exposure descriptors in a computer program are shown:



#### LEGEND:

- PNL—Perceived Noise Level
- EPNL—Effective Perceived Noise Level
- NEF—Noise Exposure Forecast

### TYPICAL NOISE EXPOSURE FORECAST (NEF) CONTOURS



Source: Transportation Noise and its Control, page 7.

### 3.3.3 A Specific Example

#### Edgewood Boulevard Environmental Impact Statement

Federal Highway Administration, Region V,  
Draft Negative Declaration for Construction  
of Edgewood Boulevard from Cedar Street to  
Logan Street, Lansing, Michigan. June, 1977,  
Appendix A.

This Environmental Impact Statement, which is in fact a negative declaration submitted under the requirements of the National Environmental Policy Act (NEPA), contains a noise analysis section (Appendix A), which applies the methodology which has been described above. Alternative highway routes are placed upon a base map. The base map includes indications of land use, soil types, and specifically, of the number, location, and type of residential structures within the project area. Then technical calculations of the noise that traffic on the proposed highway would generate are placed on the base map. 70 dBA is considered to be the maximum allowable noise level for residential areas in this assessment, and so the 70 dBA contour was used to discover how many residential structures might be exposed to levels at or beyond that level. It is important to note that these are general, broad assessments, and specific noise analysis would have to be performed at those areas where noise-land use problems are indicated as being likely. Once the estimated impact pathway, or noise contour, has been placed on the map, it becomes a straightforward job of counting the number of residential units within that pathway to determine who is likely to be exposed to the noise. Lakefront projects may require such an analysis. Assessment teams members should contact City and State transportation planners for information and assistance, and also obtain a copy of the Noise Control Act of 1972. Copies of transportation EIS's such as the Edgewood Boulevard one cited here also contain good information.

Table 3-1

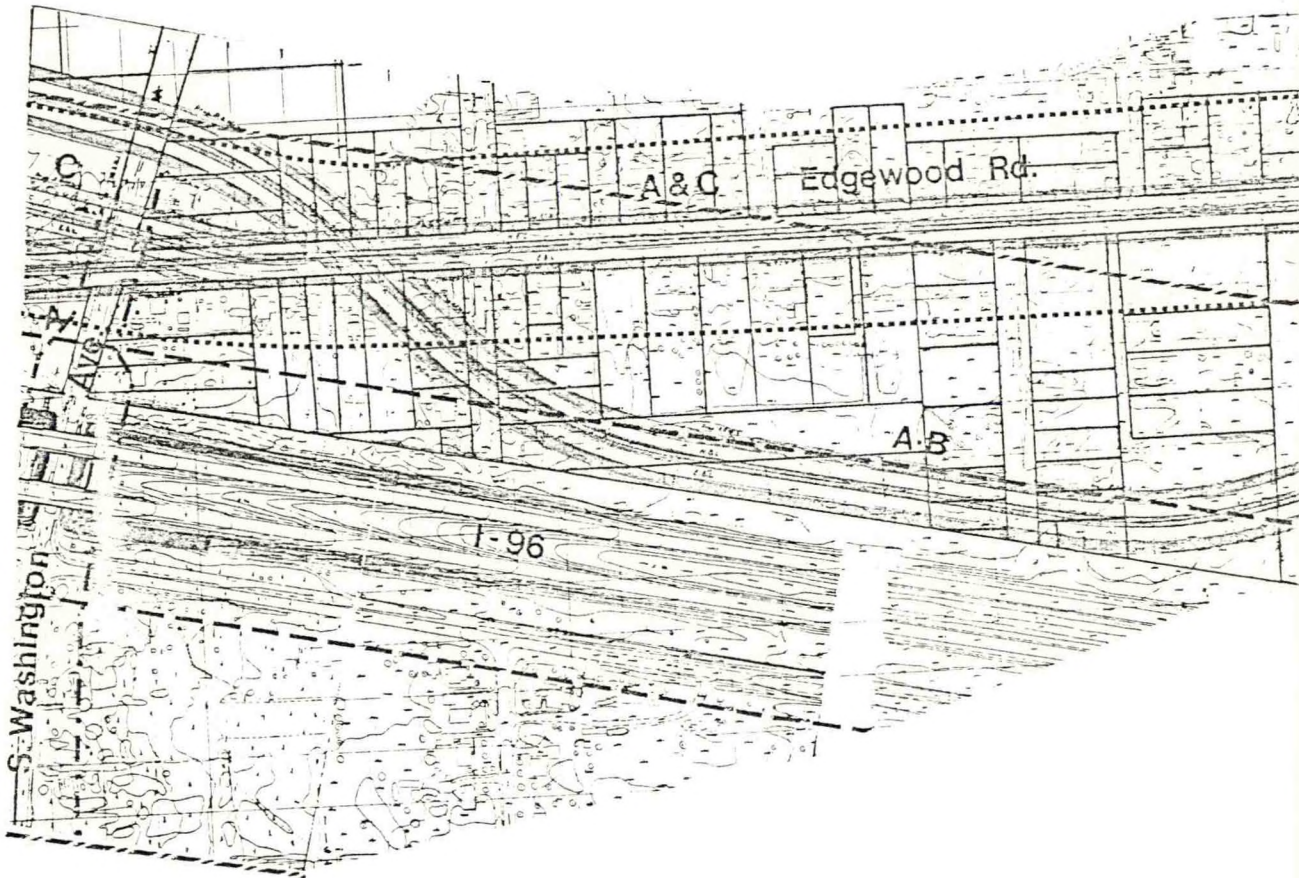
## Design Noise Level/Land Use Relationship

Design Noise Level 1 L <sub>10</sub>	Land Use	
	Category	Description
60 dBA (Exterior)	A	Tracts of lands in which serenity and quiet are of extraordinary significance and serve as important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, or openspaces which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
70 dBA (Exterior)	B	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, recreation areas, playgrounds, active sports areas, and parks.
75 dBA (Exterior)	C	Developed lands, properties or activities not included in categories A and B above.
-	D	Undeveloped land requirements are a responsibility of the local area.
55 dBA (Interior)	E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Federal-Aid Highway Program Manual, Volume 7, Chapter 7, Section 2 (December, 1974).

From: Edgewood Boulevard EIS.

70 dBA noise contour for highway route



LEGEND:

- 60 dBA Year 2000 - I-96
- - - - 70 dBA Year 2000 - I-96
- ..... 60 dBA Alternate C, Year 2000
- · - · - 60 dBA Other Streets

Noise Analysis - Alternate  
for  
Design Year 2000

SOURCE: Federal Highway Administration, Region 5,  
Draft Negative Declaration for Construction of Edgewood  
Boulevard from Cedar Street to Logan Street, Lansing, Michigan.  
June, 1977, Appendix A.

Figure 1

Table 3-2

Noise Contours-Year 2000  
I-96 And Edgewood Boulevard Alignments

<u>Alternative</u>	<u>Contours</u>			Number of Structures Possibly Experiencing Significant Effects But Not Exceeding Standards			
	<u>Distance<sup>1</sup> (feet)</u>	<u>Area Covered<sup>2</sup> (acres)</u>	<u>Distance<sup>1</sup> (feet)</u>	<u>Area Covered<sup>2</sup> (acres)</u>	<u>East</u>	<u>West</u>	<u>Total</u>
I-96	188	77	344	260	7	33	40
Alignment A	--	--	150	75	--	--	--
Alignment AB	--	--	150	75	--	--	--
Alignment C	--	--	150	73	--	--	--

<sup>1</sup>Distance from center of near lane of traffic.

<sup>2</sup>Area covered (acres) by that contour.

Source: Wilbur Smith and Associates.

From: Edgewood Boulevard EIS.

#### 3.3.4 Further Information

Another presentation of this assessment methodology, again with application to highway planning, has been prepared by the firm of Johnson, Johnson, and Roy, Inc., for the Michigan Department of State Highways.

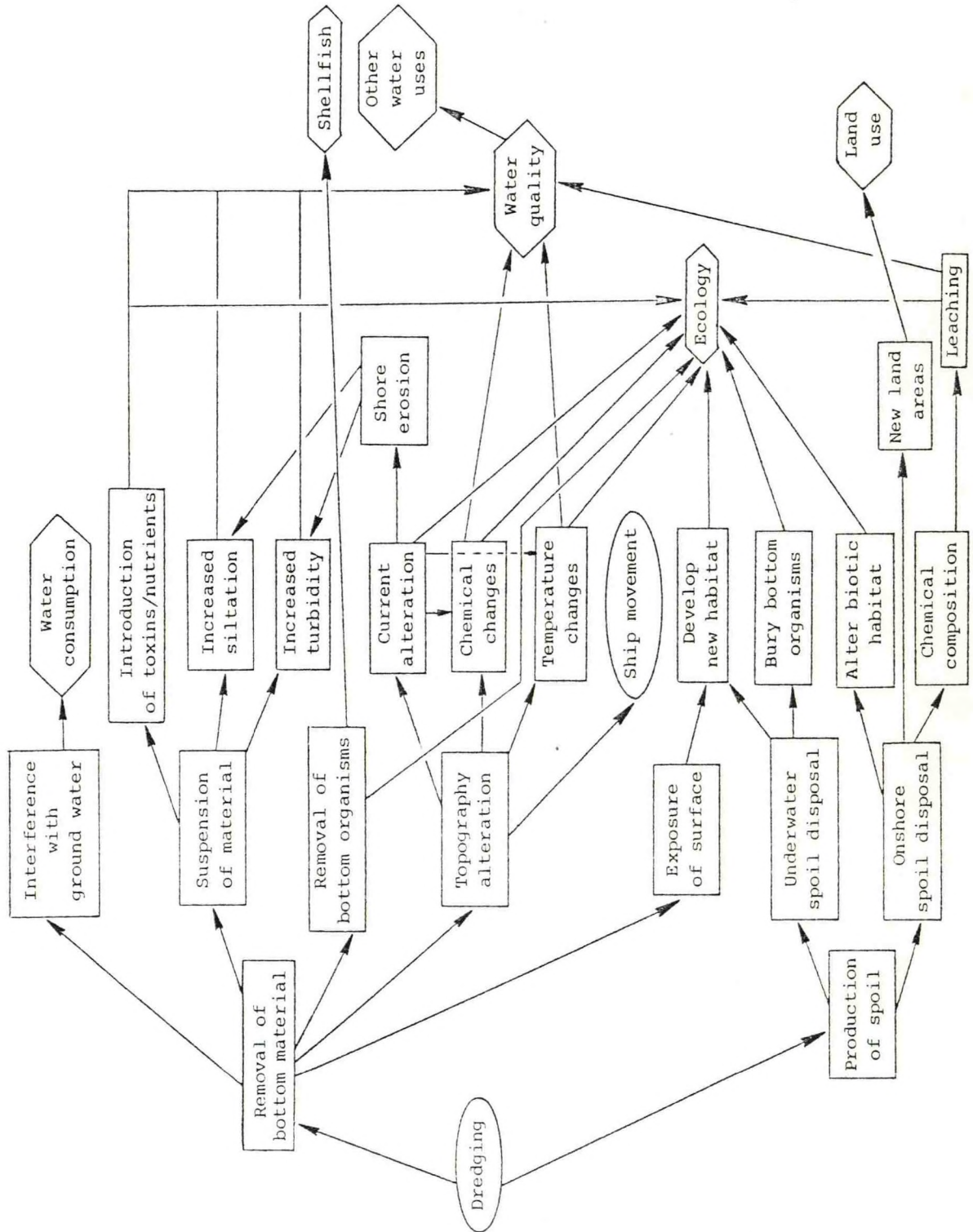
Johnson, Johnson & Roy, Inc., Planning and Design Methodology Relating to Environmental Impact Considerations in the Highway Planning and Route Location Process. Michigan Department of State Highways. July, 1972.

#### 3.3.5 Impact Network Diagram

There are many examples available of impact networks. In many instances, these are presented as matrices. However, it is our experience that in many instances the matrix is a confusing or cumbersome device. Since most networks can be displayed as either a matrix or as a chain, it is perhaps a matter of personal choice. An example of an impact network for dredging developed by the Army Corps of Engineers is included here as an example. Notice that it is a general diagram, of the impacts that tend to be associated with dredging. This general network would have to be modified to fit the particulars of a given project, and then applied to a specific site and to a specific period of time in order to obtain a detailed environmental impact identification.



Figure 2 Environmental Aspects of Dredging



Source: Army Corps of Engineers, U.S. Deepwater Port Study, Volume IV, 1972, page 79.

Figure 2

### 3.3.6 Coastal Processes

1. Bascom, Willard, Waves and Beaches, Doubleday (paperback), 1964.

This is a classic introduction to coastal processes. It is easy reading, short, and yet contains accurate and detailed information that should be of use to those involved in future Lakefront projects.

2. Strahler, Arthur N. and Alan H., "Waves, Currents, and Coastal Landforms" in Environmental Geoscience, Hamilton Publishing Company, 1973.

This is another good introduction to coastal dynamics which provides not only clear written explanations, but useful graphic illustrations as well.

3. Additional sources include:

King, A.A.M., Beaches and Coasts, St. Martin's Press, New York, 1960.

Minikin, R.C.R., Winds, Waves, and Maritime Structures, Charles Griffin and Company, London, 1950.

4. Illinois Coastal Zone Management Program

At this time, the ICZMP has the best collection of technical information on the Illinois Coastal Zone, and they should be consulted for maps, data, and assistance.

### 3.3.7 Army Corps of Engineers' Publications

1. The basic Corps' publication is their three volume Shore Protection Manual, which is frequently revised and expanded. It is available from the U.S. Government Printing Office (U.S.G.P.O.).
2. Also of particular value is a Corps' publication on environmental statements.

Department of the Army, Office of the Chief of Engineers,  
Preparation and Coordination of Environmental Statements,  
(ER 1105-2-507) August, 1976.

3. The Lakefront Demonstration Project has accumulated many technical Corps' publications dealing with the preparations of environmental assessments, and these should be consulted, along with the latest research on dredge spoil disposal and related matters which the Corps undertakes on a continuing basis.

4. A specific Environmental Impact Statement prepared by the Army Corps of Engineers is interesting in that it provides a concrete example of how the Corps prepares a statement and the kinds and amounts of information it includes. This EIS also provides information relative to the technical aspects of future Lakeshore projects. The Corps should be contacted for copies of several recent EIS's and EIA's, to be included in the Assessment Information System suggested in Section II.

Detroit District, Corps of Engineers, Final Environmental Statement: Maintenance Dredging of Unpolluted Sediments in Michigan, March, 1975.

CONCEPT: One of the most useful sections of any final EIS is the required section of Comments received on the draft EIS and responses to them by project proponents. These comments often provide important technical or policy information, and the formal responses to them are also informative.

### 3.3.8 Graphic Display of Information

1. Commonwealth Associates, Inc., Environmental Report: Michigan Pipeline Expansion, Prepared by Lakehead Pipeline Company, Inc., Jackson, MI, June, 1975.

This brief environmental report contains an excellent use of graphic materials. The graphics are used strictly to enhance understanding of the project and the environment with which it will interact. Aerial photographs and maps are placed next to each other, indicating the proposed route of the project. A fold-out illustration shows each component of a pipeline project, in terms of how it tends to interact with the land.

2. Oppenheimer, Carl H., and Isensee, Thomas, Establishment of Operational Guidelines for Texas Coastal Zone Management: Interim Report on Biological Uses Criteria, University of Texas, Austin, May, 1973.

This report contains a useful introduction to coastal biology which is not restricted to the Texas coast. Of particular interest are the methods of graphic display which the report utilizes. A biological inventory is displayed as a series of sketches showing various species in their typical environmental setting. The sketch is overlaid with a translucent cover sheet which contains identification numbers for each species in the sketch. These numbers are then listed on a master sheet with the species name for easy identification, and for better transmittal of species interrelationships.

3. Herdeg, Walter, The Graphic Visualization of Abstract Data, The Graphic Press, Zurich, Switzerland, 1976.

This is one of several excellent books on graphic design. Some of the written material is not in English, which some users have found initially disconcerting. However, the strength of this book lies not in its brief explanations, but in the graphics themselves, which suggest many techniques for environmental assessment presentations.

### 3.3.9 Urban Systems

1. Planning Environment International, Interim Guide for Environmental Assessment: HUD Field Office Edition, U.S.G.P.O., June, 1975.

This publication serves two purposes. First, it provides a good introduction to the "land-side" impacts that may be involved in future Lakefront projects. Secondly, it provides a very good set of basic references on urban impact concerns such as visual quality, sense of community, safety, and psychological well-being.

2. Cities. Scientific American/Alfred A. Knopf, 1967 (paperback).

See especially: "Transportation in Cities" by John W. Dyckman.  
"The Metabolism of Cities" by Able Wolman.  
"The City as Environment" by Kevin Lynch.

### 3.3.10 Public Attitude

Two interesting articles on what goes into the formation and change of public attitude are contained in the book, Environmental Quality in a Growing Economy, John Hopkins Press, 1968. These are:

1. Lowenthal, David, "Assumptions Behind the Public Attitude."
2. White, Gilbert F., "Formation and Role of Public Attitudes."

3.3.11 Of possible concern to neighborhood residents will be the possibility that the creation of a new public space will increase criminal activities. An excellent text on this subject is:

Newman, Oscar, Defensible Space: Crime Prevention Through Urban Design, Collier Books, 1972.

### 3.3.12 Additional Sources

1. Jenks, Sorenson, and Breadon, Coastal Zone Bibliography: Citations to Documents on Planning, Resources Management, and Impact Assessment, University of California, Institute of Marine Resources, 1976.
2. The Urban Institute, 2100 M Street, N.W., Washington, D.C., 20037.

The Urban Institute has developed an impact evaluation series of publications which the Assessment Team may find useful. Two volumes in the series are especially recommended:

Land Development and the Natural Environment: Estimating Impacts.

Social Impacts of Land Development: An Initial Approach for Estimating Impacts on Neighborhood Usages and Perceptions.

3. Utah Water Research Laboratory, Erosion Control During Highway Construction: Manual of Erosion Control Principles and Practices, Utah State University, Logan, February, 1976.
4. Bolt, Beranek, and Newman, HUD Noise Assessment Guidelines, NTIS No. PB-210-590.
5. Center of Census Use Studies, Bureau of the Census, Environmental/Socioeconomic Data Sources, Department of the Air Force, Environmental Planning Division, October 1976.
6. Lynch, Kevin, Image of the City, Cambridge, MIT Press, 1960.
7. Lynch, Kevin, What Time Is This Place?, MIT Press, 1972.

### 3.3.13 Methodologies

For a further discussion of matrices, it is suggested that the Assessment Team consult the following sources:

1. Sorensen, Jens C., A Framework for Identification and Control of Resource Degradation and Conflict in the Multiple Use of the Coastal Zone, Department of Landscape Architecture, University of California, Berkeley, 1971.
2. Leopold, Luna B., et. al., A Procedure for Evaluating Environmental Impact, U.S. Geological Survey, 1972.

For a more complex approach, the Assessment Team may wish to consult:

Isard, Walter, et. al., Ecologic-Economic Analysis for Regional Development, The Free Press, 1972.

A useful annotated bibliography of additional methodologies is:

Bennington, G., et. al., Resource and Land Investigations (RALI) Program: Methodologies for Environmental Analysis, Volume 1, 1974, Mitre Corporation.

#### 3.4 USING THE ASSESSMENT RESULTS

The best assessment does not guarantee that a project will be approved, or that a permit will be more rapidly processed, although a bad assessment will almost certainly cause delays and endanger the acceptance of the project. Once a good identification of probable impacts has been made, that information must be used if it is to have any value. The next Section traces through one possible planning process, indicating the steps of the assessment and how they fit into overall project development.

## SECTION 4

### INTEGRATING ENVIRONMENTAL ASSESSMENT INTO THE PLANNING/DESIGN PROCESS

#### 4.1 INTRODUCTION

As discussed in previous sections, the evaluation of environmental impacts that may result from a project is a continuous process that both results from and contributes to each phase of the planning and design process. There may be only one formal EIA report prepared during this process, but environmental factors should be considered in every phase of the project. This minimizes project costs and negative impacts. It also increases the likelihood of governmental and public acceptance.

Specific strategies and techniques for environmental assessment were presented in Sections 2 and 3. In this final section, an effort is made to review the overall planning process of a Lakefront project, and to suggest ways in which environmental assessment could fit within and affect that process. This is presented as a suggested approach that would require "fine tuning" by those involved in the actual assessment effort. It is important when considering the following material to realize that to an unusual degree the City of Chicago has emphasized environmental assessment as a key element in any Lakefront development. Therefore, the material which follows is not only a possible conceptual framework for future Lakefront projects, but also a recording of an environmental assessment process that has already begun.

#### 4.2 PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT (PHASE I)

As mentioned in Section 3, the assessment effort involves a project-long search for information about possible positive or negative impacts, and the ways in which modifications of the project might affect those impacts. At first, judgment will be a critical part of the assessment process: in determining where to start; what research to undertake; and how much time and effort to spend on any one element. The purpose of a Phase I assessment is to obtain a broad overview of the project, its major components, and major types of impacts that may be involved. Following are some suggested steps which suggest how to start this preliminary assessment and how it fits with the planning and design process.

- Review Lakefront Demonstration Project materials. The Lakefront Demonstration Project resulted in the preparation of several products, one of which is this handbook. Other products of use in this initial assessment are the results of the Design Workshops; The Cost-Benefit Analysis Handbook; and the Environmental Information Directory. A review of this material will help the Assessment Team prepare a tentative listing of possible areas of impacts.

- Review Planning Literature  
Books, reports, environmental impact statements and government regulations could be helpful in identifying probable impacts. Section 3 includes several references which can be of assistance at this phase of the assessment.
- Obtain Expert Advice  
Experts can be available locally in Federal, State, or local agencies. If not, consultants may have to be contacted. Within the context of the Chicago Lakefront Project, expert advice would be advisable in the areas of wave dynamics, coastal processes, and possibly fugitive dust emissions from area sources.
- Develop Initial List of Impacts  
Using the information gathered from the first two steps, it should be possible to establish a list of probable impacts that would result from any lakefront expansion along the Chicago waterfront. This would be a preliminary master list of concerns. It serves as a hypothesis to be refined by continuous research, review, and comment, and testing.
- Develop Initial List of Environmental Regulations  
As discussed in Section 2, under Satisfaction of Regulatory Requirements, it will be important to establish a Lakefront Regulations Handbook for use by the Assessment Team. At this point in the assessment process, that collection should be used to formulate a flow diagram indicating when various permits must be obtained, how long they are likely to take to process, and when permit applications must be prepared. The preliminary PERT diagrams developed during the Demonstration Project should be of use here. The purpose of these initial efforts is to gather together sufficient information so that a first meeting can be held with project planners and designers.
- Hold Preliminary Project Conference  
A considerable amount of initial environmental assessment work can be undertaken prior to the initiation of specific project planning and design, as described above. The purpose of the conference is to identify: Design complaints; design criteria; screening procedures; and and informational needs. This information can then be integrated into the planning and design criteria, and serve as a filter to preclude even initial formulation of project alternatives which would clearly be unacceptable in environmental terms.



This initial conference will also allow the Assessment Team to inform others involved in the Lakefront project as to Assessment Team informational needs and capabilities.

- Plan Research

There will be a need for social, economic, geologic, hydrologic, chemical, atmospheric, and other types of information. It will be required by planners, designers, and members of the Assessment Team. It is anticipated that research costs can be kept down if an overall program is established at the outset of the project. After the informational needs of each group are identified (and these will be modified over the span of the project), the project manager can allocate responsibility for data collection and analyses. If the Assessment Team is given a significant research responsibility, it can gain the information it needs for subsequent formal assessments, while being fully involved with the overall project. However, it will be necessary to strike a balance and not overburden the assessment team with research responsibilities that might detract from its principal tasks.

- Develop Base Maps

Section 3 discusses the importance of this effort, and should be reviewed by the Assessment Team at this phase of the assessment.

CONCEPT: The Assessment Team must establish a clear identification of the various types of assessment that it may have to undertake and determine how they relate to each other. Section 1 discusses the functions of environmental assessment which the team will be required to adhere to. There are two different levels of assessment:

System-wide - This deals with the cumulative impacts of construction and/or utilizing the entire complex of lakefront extensions suggested in The Lakefront Plan of Chicago.

Site-specific (project level) - This deals with the impacts associated by construction and operation of one specific proposed project as being submitted to the Corps of Engineers for approval. Content and organization of the assessment is specified by the Chicago District of the Corps. For clarity and coherence, the organization should include separate discussions of construction-related impacts and operation-related with Section 4.

### 4.3 PHASE II ENVIRONMENTAL ASSESSMENT

Once alternatives begin to emerge from the planning and design process, it will be possible to undertake a second level of assessment. It is important to note here that this discussion is both suggestive and idealized. In reality the assessment process will not be as clearly separated from the planning and design process. Environmental assessment is also reiterative and fluid. That is one reason why a small close-knit group is necessary if the assessment is to maintain continuity throughout the process of project formulation.

#### 4.3.1 Limiting the Number of Alternatives

The alternatives that need to be considered in an EIA are all those given consideration by the design team or the City Decisionmakers. Usually, the alternatives can be grouped into 1) alternatives at other locations and 2) alternatives to design at the selected sites. Of course, the no action alternative must be addressed. By limiting alternatives to the above three categories, it usually is possible to present a concise and coherent discussion of each. At this point, it is possible to discuss only incremental change in impacts attributable to each alternative. The reviewer already should have a clear understanding of the impacts of the selected alternative.

As mentioned previously, the City will follow several objectives in the development of any future Lakefront project. There will be political, economic, engineering, and environmental factors, each of which will influence this phase of the project. By having supplied the planners and designers with environmental information at the outset of project development, emphasizing statutory or policy constraints, the Assessment Team will have done much to assure that environmental criteria have a prominent role in this process.

#### 4.3.2 Identify Impacts of Alternatives

Once a "universe" of a limited number of specific alternatives has been established, the tasks of the Assessment Team become more formal. At this point, it will be necessary to establish the exact informational requirements of the various groups for which the Assessment Team must provide environmental information. Section 2 provides suggestions on how to determine these requirements. What the Assessment Team must decide at this stage is how much information is necessary. At a minimum, it is suggested that the Assessment Team develop assessments of each of these preliminary alternatives that would probably be acceptable for a formal Environmental Impact Statement as required by NEPA. Discussions with the Corps, other Federal agencies, and a review of actual EIA's and EIS's should provide a good idea of just what length the type of information is appropriate.

CONCEPT: The adequacy of an assessment may be judged upon how much serious consideration was given to alternatives. Thus, the Assessment Team is faced with the difficult task of judging how much is enough. The function the assessment is serving in part will determine this: a briefing for City Decisionmakers requires different detail and emphasis than a formal EIA for a Corps' permit application. The complexity of the project, and of the environment in which it will be located, also helps determine how much description should be provided. As a basic rule, the more complex the project and/or the environmental setting, the more likelihood for impacts, and the greater the need for detailed assessment. Agency or public concerns are another measure, and that is why outside input is an important part of the assessment process, as described in Section 2.

#### 4.3.3 Utilize the Assessment Technique Described in Section 3

By the time a limited number of alternatives have been identified, it will be necessary to use the level of specificity obtainable from the techniques presented in Section 3. Additional references cited in that section, especially those dealing with specific impact areas, such as noise, should be consulted. Once impacts have been identified in time and space, using those techniques, it will be necessary to evaluate the impacts.

#### 4.3.4 Evaluate Impacts

Once probable impacts can be described in terms of location, duration, and intensity, it is possible for the project team, including designers, planners, and the Assessment Team to determine the suitability of the various alternatives. Are any of them clearly unacceptable? Hopefully, the initial screening will have already precluded the most obviously disruptive alternatives. But once a detailed impact assessment has been carried out, each alternative must again be judged. Are they compatible with the policies of The Lakefront Plan of Chicago, and the Lake Michigan and Chicago Lakefront Protection Ordinance? Do they fit all City, State and Federal performance standards? What are the benefits to be derived from each? What specific changes will occur if a given alternative is constructed? What are the trade-offs?

Once this has been worked out by the project group, some alternatives may be dropped, or modified, and then re-evaluated. Some alternatives which were earlier rejected may now receive more detailed assessment, and new alternatives may be developed. There is a possibility that none of the alternatives will be acceptable, in which case the whole process will have to start over or be abandoned. Assuming that a limited number of alternatives are found to be acceptable, it then becomes necessary to decide how they will be described for review and comment.

Attention should be given, as suggested in Section 2, to the specific groups that will be interested in the assessment. In serving the various functions identified in Section 1, such as regulatory function and information function, different formulations of project descriptions and evaluations may be necessary.

CONCEPT: There is an adage which states that a book should not be judged by its cover. However, publishing firms spend thousands of dollars in the layout and design of newspapers, books, reports, and magazines. It does make a difference.

At this stage in the evolution of a project, the alternatives must go out for review. How the information is organized, how clear it is, will have a significant impact upon how it is received. It is possible to "overdo" graphics spending too much money and generating a negative response from some reviewers. However, the report should reflect the amount of effort that went into the assessment. It should not only be accurate, complete, and competent; it should also look that way. Guidelines on graphic presentation of environmental information is cited in Section 3.

#### 4.4 REVIEW

Once the Phase II assessment is complete, it is important to submit the results to a wide audience. The purpose is two-fold. First, this brings all interested parties, including regulatory agencies, up to date on what has been done. It is a form of communication and should be treated as such by the project group. Secondly, the review will provide input to the planning, design, and assessment process. Factors may have been overlooked. Mistakes may have been made. Data may be inaccurate. Judgments may be questioned. It is also usually the case that positive input will be provided, indicating to the project group those areas in which there is acceptance for their process and their conclusions.

The review process should be overseen by the planning group, with assistance provided by the Design and Assessment Teams as needed. How it will be conducted is subject to City policy determinations. Some suggestions can be obtained in the Section 2 discussion of Public Participation.

The comments received should be recorded for possible inclusion in formal EIA's or EIS's. A response should be developed for each comment. Some of these comments will require specific input from the Assessment Team, while others may require input from either other teams or the combined project groups. Some responses will require input from other Departments or from City Officials. Once all of the comments have been responded to, either through design changes, project abandonment, the development of mitigation strategies, or a statement of why the comment is not valid, then the next phase of project development can take place.

#### 4.5 SELECTION OF PREFERRED ALTERNATIVE

If the Reviewer does not lead to a decision to abandon the project, then one specific alternative will have to be chosen, out of the limited number of preliminary alternatives which have been reviewed. This is obviously a critical decision point, but it is one from which environmental assessment is sometimes excluded. However, if the integrated planning/design/assessment approach which this Handbook suggests has been followed, then this difficult decision phase can be somewhat simplified, and lead to more environmentally sound decisions.

It is impossible to proscribe how a final choice should be made. If one alternative has less environmental impact potentials and is also less expensive and can support the maximum amount of public use, the decision process would be greatly simplified. However, it is more often the case that each alternative has certain good and bad points. Complex trade-offs between impact, cost, and recreational benefit are involved. And the decision calculus is further complicated by a series of external factors New regulations, changing priorities, available Federal funding...these are just some of the exogenous factors that may ultimately determine which alternative the City finally chooses. The project group will have to go through its own decision process to derive a recommendation. That will then have to go to City Officials for a final choice.

CONCEPT: This may be one of the most demanding times for the Assessment Team. As the final choice is made, there may be many questions over the details of specific project elements. Just how much noise will be generated on a particular street if Alternative A is chosen over Alternative D? Just how much turbidity will be involved? What does the chart on Page X mean?

If The Assessment Team has done its job;  
if it has a good handbook of regulations;  
if it has a detailed social and physical inventory; if it has a network of technical sources both within and outside of the

City; if its Information System is well designed; then it can provide invaluable assistance to the decisionmakers. But requests will be immediate and demanding. There will be little if any time for research and long deliberations. The ability of the Assessment Team to function well at this critical and demanding phase depends to a large extent how well they have prepared.

#### 4.6 SUBMISSION OF FORMAL PERMIT REQUEST(S)

Assuming that at least one alternative is acceptable to the City, and has survived the screening process presented above, then formal approval must be obtained from those regulatory agencies having authority over the project. Section 2 emphasizes the need to have identified all such authorities at the outset of the project, so that there will be adequate time to prepare required information and to coordinate permit applications so that a minimum delay is involved.

As should be clear by now, the integration of environmental assessment into the process of project formulation provides an effective way of preparing permit applications. For the Corps, a formal Environmental Impact Assessment will be required, that will be reviewed and commented upon by other Federal Agencies, the State of Illinois, City Departments, and various interest groups and individuals within the general public. If the assessment process suggested in this Handbook has been followed, at this point the Assessment Team has prepared an EIA capable of being submitted with the permit application.

Earlier decisions and determinations made during the development of the project should be reviewed for technical accuracy. Review all of the information, and make sure that the latest regulatory requirements are known and are being met by the proposed alternative. Record the process by which the project has evolved, with emphasis upon the environmental assessments that have been made and how they influenced the final choice. Follow the format required by each permitting agency.

#### 4.7 WHAT HAPPENS IF AN EIS IS REQUIRED

The Corps requires the preparation of an Environmental Impact Assessment (EIA) statement as part of its permitting process. Whenever a Federal permit is required, the permitting agency must determine whether or not a formal Environmental Impact Statement (EIS) is needed, in accordance with the National Environmental Policy Act and regulations promulgated under its authority. If the Corps, as lead Federal permitting agency, determines that an EIS is not required, then the Corps (not the City) prepares a Negative Declaration, stating the nature of the project,

the permit or permits the Corps intends to grant, and why an EIS is not required. Section 3 cites a Negative Declaration for a highway project which indicates that a Negative Declaration can, in and of itself, be a major document. The Negative Declaration is distributed for review, and unless major objections or a court challenge result, the permit can then be granted. The Corps, in granting a permit, may stipulate several modifications to the project or certain monitoring efforts to measure potential problem areas. Throughout this process, the Corps may desire environmental information which the Assessment Team will be asked to provide. If the Corps and other Federal agencies have been consulted during the assessment process, as suggested in Section 2, then many of these information requests will have been foreseen and answered ahead of time.

If an EIS is required, then the project cannot go ahead until draft and final EIS's have been prepared, circulated for review, and approved by the Environmental Protection Agency. This EIS process is a Federal process, largely outside the control of the City, and it can take as long as one or two years. As mentioned in Section 2, there are several steps which the Assessment Team can take to either avoid the need for an EIS or minimize the time involved in a full EIS process. In preparing its EIA as part of the Corps' permit application process the City should assume that an EIS will be required, and provide EIS quality and depth in its EIA statement. If all of the probable impact have been clearly and objectively identified, and if every possible mitigation strategy has been utilized, including project modification or the rejection of some alternatives, then there may not be a need for an EIS. If one is needed, it will be much easier to prepare, if the City has developed a good EIA.

#### 4.8 MONITORING PROJECTS

As a project is being constructed and then as it is being utilized, the Assessment Team should undertake frequent field investigations to determine how accurate their assessment was. New concepts of impact mitigation can often be thought of while actually watching a project, rather than dealing with an abstract description of it. Photographs should be taken, both in black and white and as slides. These can be used in progress reports. They can also be used in future formal impact assessment statements. The project should be seen in part as being a testing ground. By paying careful attention to the actual rather than projected impacts, and the effectiveness of the overall planning/design/assessment process, the City's skills in these areas can be upgraded, so that future projects are even better. This may seem obvious, but often the task of the Assessment Team is seen as being completed once necessary permits are obtained. Personnel may be reassigned, or budget allocations

for the Team removed. The City can gain an invaluable amount of skill and information from a structured analysis of the project as it is being constructed and then used. But to do this, it must be planned for, and budgeted for. If The Lakefront Plan of Chicago is to be achieved, then this kind of follow-up assessment is essential. Also, it will be important to constantly update the Assessment Information System and the Regulation Handbook. Again environmental assessment is an ongoing, reiterative process.



# APPENDICES

**APPENDIX A**

**CORPS OF ENGINEERS**

**IMPACT ASSESSMENT**

**GUIDELINES**

APPENDIX A

CORPS OF ENGINEERS  
IMPACT ASSESSMENT  
GUIDELINES

PREPARATION OF ENVIRONMENTAL ASSESSMENTS

Content of Assessment to be in the following format:

The body of the environmental assessment will contain eight (8) separate sections. These sections are:

1. Project Description.
2. Environmental setting without the project.
3. Relationship of the proposed action to land use plans.
4. Probable impact of the proposed action on the environment.
5. Any probable adverse environmental effects which cannot be avoided.
6. Alternatives to the proposed action.
7. The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity.
8. Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Each section should be of sufficient length and detail to adequately identify and develop the required information and to comply with the Council on Environmental Quality (CEQ) guidelines. Language used should be clear and easily understood in order that those individuals making an evaluation can provide decisions or form opinions on the merits of the proposed work.

The use of footnotes is encouraged provided the assessment text remains essentially understandable to a reader without the need for obtaining specific reference material. Any attached bibliography should indicate the sources of all information based on other documents and how these documents may be obtained.

### 1. Project Description

Describe the proposed action by name, specific location, project dimensions and purposes and the current status. Generally, delineate the purpose of the project, what the plan of improvement entails and how the plan would operate. A complete description of all structures, and activities included with the project should be discussed. The interrelationship and compatibility of the project with existing or proposed projects by others must be discussed.

### 2. Environmental Setting Without the Project

Describe the area, the present level of economic development, existing land and water uses, 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, archaeological, geological features, and social and cultural habits and customs. Discuss population trends, agricultural and industrial trends, and describe what the future environmental setting is likely to be in the absence of the proposed project. The source of population data used should be identical.

### 3. Relationship of the Proposed Action to Land Use Plans

Discuss how the proposed project 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 including those developed in response to the Clean Air Act or the Federal Water Pollution Act Amendments of 1972 (P.L. 92-500). If a conflict should occur, the assessment should discuss the issues completely and state the actions that the applicant 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.

### 4. The Probable Impact of the Proposed Action on the Environment

Environmental impacts viewed as changes or conversions of environmental elements which result directly or indirectly from the proposed action should initially be identified and projected throughout the life of the project. Include land losses and land use changes which could be expected upstream, downstream, and adjacent to the project such as urbanization changes, in-water features and characteristics, air quality, aesthetics, etc. Discuss the impacts on the environment of project-induced primary and secondary economic and social effects, including cumulative effects. Quantitative estimates of losses or gains (e.g., acres of marshland, miles of white-water streams inundated, etc.) will be set forth whenever practicable. Where this cannot be done, qualitative descriptions should be provided with assumptions or criteria on which judgments are based.

Discuss both the beneficial and adverse impacts of the environment changes or conversions placing some relative value on the impacts described. Discuss these effects not only with reference to the project area, but in relation to the watershed or ecosystem. For example, the filling of a portion of a wetlands or estuary would involve conversion of aquatic/marsh areas to terrestrial environments, the loss of wetland habitats and associated organisms, a gain in area for terrestrial organisms, a change in nutrient composition of the runoff water entering that portion of the estuary, alteration of the hydrology of some given area; perhaps the introduction of buildings or roads, curtailment of certain commercial uses, disruption of water-based recreational pursuits, conversion of wildlife aesthetics to less-pristine attributes, perhaps the removal of some portion of popular duck-hunting grounds or unique bird nesting area, etc.

Identify remedial, protective, and multigation measures which would be taken as a part of the proposed action by the applicant to eliminate, or compensate for any adverse aspects of the proposed action.

Points to consider in preparing the assessment should include frequency of maintenance dredging, volume of materials to be removed, dredging methods and location of disposal area or areas.

#### 5. Any Probable Adverse Environmental Effects Which Cannot be Avoided

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 paragraph 4. It should include a discussion of adverse effects of 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 archaeological value.

#### 6. Alternatives to the Proposed Action

Describe the various reasonable 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.

7. The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity

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. For example, if a coastal marsh is extensively filled the ability of an associated estuary to support its normal biota might be seriously impaired. Altered sediment, nutrient and biocide additions to the waters might well affect the inherent biological productivity of the estuary. In other words, if the estuary's marshes are modified enough to affect basic estuarine processes, certain of the amenities, namely, biota, products, industry, and recreation opportunities could be lost. The long-term implications of these changes are directly related to the degree that the losses are sizable or unique.

8. Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented

Discuss irrevocable uses of resources, changes in land use, destruction of archaeological or historical sites, unalterable disruptions in the ecosystem, and other effects identified in paragraphs 3 and 4 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. For example, in filling a marsh there could be a number of potential irreversible or irretrievable effects. The particular aquatic habitat filled in the marsh would be permanently lost for aquatic organisms and fill would be removed from one area and deposited in another. Include possible indirect actions - thus made economically feasible, as a result of the proposed action that would cause changes in land and water use that could not be altered or reversed under free enterprise principles.

In compliance with CEQ guidelines, dated 1 August 1973, the following general types of information are provided to assist you in preparing an environmental assessment. You are advised that this list is not inclusive due to the character of regions and differences in proposed projects. Therefore, additional information when necessary or for elaboration on specific points, must be provided.

WATER AND AIR QUALITY

Take samples and analyze for parameters listed below.

Water

Ammonia (all forms)  
Biological Oxygen Demand (BOD)  
Copper  
Dissolved Oxygen (DO)  
Dissolved Solids  
Fecal Coliforms  
Inorganic Carbon  
Inorganic Nitrogen  
Pesticides  
Phenol  
pH  
Temperature  
Toxic Substances

Sediment

Analysis of bed of waterbody should include:

Volatile Solids  
Chemical Oxygen Demand  
Total Kjeldahl Nitrogen  
Oil-Grease  
Mercury  
Lead  
Zinc  
Total Phosphorus  
Total Organic Carbon

Air

Carbon Monoxide  
Hydrocarbons  
Nitrogen Oxides  
Particulate Matter  
Sulfur Oxides  
Photochemical Oxidants

Geology of the area including a general description of topographic features of the surrounding terrain.

Climate - Average annual temperature including range of temperatures, and average annual precipitation (monthly figures) should be indicated.

Describe the adjacent land and shoreline area in terms of regional and local development which should include:

1. Diversity (commercial, residential)
2. Current Use
3. Density
4. Trends and Patterns

Discuss aesthetics of the area in terms of noise, odor, and visual aspects.

Locations and designated areas, types, and significance of historical, cultural and archaeological entities. The presence or absence of these features must be documented.

#### Flora and Fauna

In the listing below, indicate existing local flora and fauna densities.

Categories (in all cases, list by species and indicate densities in terms of abundance, common, rare, and endangered).

1. Fish and other aquatic fauna, such as amphibians, crustaceans, etc.
2. Water fowl and other avian fauna.
3. Non-domestic terrestrial fauna such as cows, horses, etc.
4. Domestic terrestrial fauna such as cows, horses, etc.
5. Wetland vegetation such as cattails, bullrushes, etc.
6. Other aquatic vegetation below the waterline including algae.
7. Terrestrial vegetation: Natural - including trees, grasses, weeds, and shrubs. Agricultural - wheat, corn, etc.
8. Endangered or unique species of the area. The presence or absence of endangered species must be documented.

#### Action Description

Describe the proposal by name, its specific location and summarize its objectives, purpose and the activities which will ensue if it is adopted. Provide technical data adequate to permit a complete understanding and a careful assessment of environmental impact. Where relevant maps and diagrammatic sketches should be provided.



### Water Supply

Describe any temporary and permanent effects the project will have on groundwater quantity and quality.

### Legal

Describe your project in terms of compliance with Federal, State and local government guidelines such as:

1. Flood Plain ordinances
2. Zoning ordinances
3. Building codes
4. Waste disposal restrictions
5. Highway load limit restrictions (during construction)

### Flooding

- A. Describe the effects of flooding on completed facility.
- B. Describe methods to be employed to prevent flood damage.
- C. Describe the effects the project will have on the shoreline in terms of:
  1. Effects on downdrift or downstream shore.
  2. Effects on upstream or updrift shore.
  3. Erosion prevention methods.
  4. Protection against wave wash.

### Recreational Values

- A. Will the project result in conversion of land to recreational use? From Recreations Use? If so, to what degree?
- B. Will the project result in expansion of existing recreational facilities? If so, to what extent?
- C. Describe the positive or negative effects of the project on:
  1. Boating
  2. Swimming
  3. Hunting
  4. Fishing
  5. Camping
  6. Park or Playground use
  7. Other

### Noise

Describe any excessive existing noise and anticipated noise during and after construction in terms of:

- A. Source
- B. Magnitude (maximum in db)
- C. Abatement measures
- D. Effects on neighboring area

### Aesthetics

- A. Describe actions to be taken to protect and/or beautify the beach (or bank) after construction. Greenery? Seeding? Sodding? Rip Rap? Compacting?
- B. Describe actions to be taken to minimize damage to existing aesthetic values.

### Odors

Describe any existing odors, and anticipated odors during and after construction in terms of:

- A. Sources
- B. Magnitude (mild, pungent, toxic)
- C. Abatement measures
- D. Effects on neighboring area

### Navigation

- A. Will the project result in increased congestion on the waterway? If so, describe.
- B. Will the project result in encroachment on the channel by moored vessels? If so, describe.
- C. Will the project result in any interference with commercial navigation. If so, describe.
- D. Will the project result in any obstructions or submerged structure during or after construction? If so, describe the lighting and marking to be employed to identify the obstruction?
- E. If the proposed structure extends into the waterway, what means of lighting and marking will be employed?

### Access

- A. What means of access to the construction site will be used (e.g., water, rail, roads, combination).
- B. Describe the probable impact of the project (both during and after construction) on vehicular and pedestrian traffic, parking etc.

### Spoil Disposal

Describe spoil disposal site in terms of:

- A. Location
- B. Methods of retention
- C. Seeding, sodding, planting

### Historical, Natural Historical, Archaeological, Architectural, and Anthropological Values

What impact, if any, will the project have on the following:

- A. Sites of historical interest
- B. Fossil beds
- C. Proposed or designated wildlife or nature sanctuaries
- D. Indian burial grounds
- E. Structures of architectural value

### Economic Values

- A. Estimate the cost of project.
- B. Estimate the number of jobs that will be created by the construction after the entire project is completed.
- C. Discuss the need for the project by the community in terms of existing facilities, effects of completion, effects on the economic balance of the community.
- D. Discuss any possible loss of jobs resulting from the project.
- E. Will the project result in a flow of funds into and/or out of the community?
- F. Describe short-range and long-range positive economic aspects of the project not mentioned above.
- G. Describe short-range and long-range negative economic aspects of the project not mentioned above.
- H. Indicate any anticipated changes in land values resulting from the project.

### Health and Safety

- A. Describe and report (1) any unusual hazardous conditions present during construction (i.e., blasting, toxic substances, flammable substances, diving, etc.) and (2) methods of minimize such dangers.
- B. Describe any adverse effects on public health or safety resulting from the construction (i.e., inadequate sanitary facilities, dispersion of noxious substances, etc.)

Alternatives

Discuss alternative locations, structures, methods. Explain the advantages and disadvantages of the selected alternative. Indicate the negative effects that would result from abandoning the proposed project.

Public Opinion

Include any indications of positive or negative public opinion regarding your proposed project (e.g., newspaper articles, editorials, letters, petitions).

APPENDIX B

TOPICAL AREAS OF CONCERN

## APPENDIX B

### TOPICAL AREAS OF CONCERN

The purpose of this Appendix is to briefly touch upon the primary areas of concern under each of the major headings required by the Corps of Engineers in the Environmental Assessment. Review of these Topical Areas of Concern at a very early stage in the environmental assessment process provides an opportunity for determining which of these subject areas can be handled within the Department of Development and Planning, which of these can be developed by other local governmental agencies, and which of these need to be subcontracted to an outside consultant. Most of the assessment can be developed without the assistance of outside consultants except for critical areas such as coastal and lakeshore processes and air emission modeling.

It is important to remember that these Topical Areas of Concern provide the basis of the Environmental Setting section. In the Environmental Setting, all topics needed to discuss impacts must be covered in sufficient detail for the reviewer to be able to make a judgment concerning the relative importance of the impact. Therefore, the impacts identified in Section 4 to a large extent determine the contents of the Environmental Setting, when actually writing the Environmental Impact Assessment development of the Environmental Setting and the section on Environmental Impacts is an iterative process. That is, discussion of each element of the physical environment in Section 2 will need to be modified as impacts become clarified in the development of Section 4.

The organization of the remainder of the Appendix follows the suggested outline for the Environmental Impact Assessment on the demonstration project. The order in which each of these topical areas appear provides a logical and coherent flow of information which will made the evaluation of the impacts for the demonstration project readily identifiable and readily understood.

#### A. PHYSICAL ENVIRONMENT

##### 1. Geological Setting

The primary issue that needs to be discussed in the geological setting is the sedimentary and structural framework of the project site. That is, the emplacement of large quantities of dense rock on the existing lake bed has the potential for causing problems with stability. Consequently, in the environmental setting, the nature of the bottom materials, the stability, the basement rock, and the geological structure need to be clearly developed. Reviewers will be looking for sufficient information to be assured that once the landfill is in place, it will remain stable and that subsidents will not be a problem.

## 2. Atmospheric Setting

Air quality parameters that should be discussed include particulates, sulfur oxides, nitrogen oxides, carbon monoxide, and hydrocarbons at a minimum. Early in the assessment process, there should be a meeting with the Corps of Engineers and the U.S. EPA to determine whether computer modeling of fugitive dust sources during both construction and operation will be necessary. If models are required by the agencies, then either AQDM or CDM are available and can be applied to area sources. This is one area where the city may have to subcontract since fugitive dust emissions are very difficult to model accurately when the emissions originate from area sources. The emissions of construction traffic, including both vehicles and vessels will also have to be addressed in this section so that the incremental change can be documented in the section on Environmental Impact.

## 3. Hydrologic Setting

As conceived in this outline, the hydrologic setting will be limited to groundwater and the surface water on the land. Discussion of Lake Michigan water levels also needs to be covered. Primary issues in this section cover both the quantity and quality of the water resources in the Demonstration Project Impact Region. The discussion of groundwater quality and quantity needs to document the presence or absence of wells near the project site in addition to the configuration of the water table on an annual and/or seasonal basis. Discussion of surface water hydrology, both quantity and quality, needs to identify the presence of any outfalls in the area of the demonstration project as well as discussing insofar as possible, the quality of those discharges. A logical inclusion in this section is a map showing surface drainage into Lake Michigan. Finally, the lake levels need to be discussed including changes in level caused by long-term cycles of precipitation, the annual cycle of changes in the lake level, and storm surges or seiches. These changes in water level have important implications with respect to the minimum elevation of the top of the landfill to assure that flooding will not be a problem once the recreational areas have been filled.

## 4. Littoral Setting

The Littoral Setting is going to be one of the most critical in the Environmental Setting since this section will present the information necessary to evaluate the long-term stability of the beaches included in the demonstration design and areas where erosion has the potential of being a problem after the project. This to is an area where subcontracting to an outside consultant may be necessary. Major issues included in this section are: long-shore and off-shore movement of sediment; beach drift; long-shore currents; and, littoral cells. Wave height and energy estimates are available from recent Corps of Engineers investigations. Wave energy needs to be thoroughly discussed so that the reviewers will be able to evaluate the stability of the beaches, breakwaters, piers, and other structures subjective to wave attack.

## 5. Aquatic Ecosystem

Insofar as possible, this section needs to document the species of fauna and flora present within the demonstration project impact region. Emphasis should be placed on the species inhabiting the area that will be disturbed by the placement of fill material. If population values are available, these should be included.

## 6. Terrestrial Ecosystem

The terrestrial ecosystem in this urban setting, takes on less importance than the aquatic ecosystem. This is only because of the highly developed nature of the landward portion of the demonstration project area. The existing system is largely limited to residential land use with only scattered areas of landscaped vegetation. Consequently, the section can be a very brief discussion of the species present including their distribution near the site.

## B. SOCIAL ENVIRONMENT

### 1. Demographic Characteristics

It is important that this section avoid being a compendium of tables taken from the census data. It should not include numerous tables showing the demographic characteristics of the entire city. Instead, it should focus on the characteristics of the neighborhoods that will be effected by the construction or operation of the demonstration project. Specific categories that should be included are: age (probable graphic - population pyramid); race; national origin; and, the change in population through the last three or four census periods.

### 2. Security

This section of the Environmental Setting needs to include data on the relative security of existing residents and visitors to the impact region. Data present could include crime rate statistics and the level of police and fire protection available in this portion of the city.

### 3. Privacy

Construction and operation of the demonstration project has the potential for impacting on the existing level of privacy afforded the residents near the project site, particularly residents of the highrises immediately adjacent to the lake. This brief section should then include a straightforward, factual discussion of the degree of privacy presently available. In the impact chapter, the effect of construction workers and recreationalists will need to be addressed. It is important, when discussing an issue such as privacy, to keep judgements out of the assessment. Judgements are reserved for the impact section and for the reviewers of the EIA.



#### 4. Public Health and Welfare

This section needs to include the health and social services available within the area of the demonstration project. One of the most important are emergency services. The presence of construction workers and recreationalists have the potential of impacting on the current level of emergency services provided. Reviewers will need to be able to judge whether the project causes sufficient incremental change in the demand for emergency services to require additional facilities.

#### 5. Psychological Well-being

This should be a few paragraphs which clearly present the nature of the existing community as it relates to the psychological well-being of the residents, businessmen, and visitors. The discussion should present an objective characterization of existing conditions before the project. The impact section should address the changes that will be caused by the presence of construction activity and recreational activity after the project has been implemented.

#### 6. Community Cohesiveness

Development of the demonstration project in the area could affect the existing cohesiveness in the community adjacent to the lake in the impact region. Therefore, this section should present, in a few paragraphs, a clear discussion of the degree of cohesiveness presently existing.

#### 7. Recreational Opportunities

For recreational opportunities, the lakefront of the entire city of Chicago and Evanston needs to be included in the discussion. Focus should be on lakefront as opposed to community or neighborhood parks and recreational areas. Visitation rates, demand projections, and alternative sites for each activity need to be included within the constraints of the available data. Since recreation is one of the primary objectives of the demonstration project, this section will help to justify the need for the entire demonstration project. Material presented should include maps showing lakefront developments on the flanks of the demonstration project as well as activities available at each of the sites. Tables showing visitation by activity should be included as available. It is important to document in this section, the existence of any overcrowding conditions at any of the recreational areas near the demonstration project. Problems created by excess pressure on the physical environment should be carefully noted and documented.

#### 8. Needs of User Populations

This section should briefly discuss the support services and facilities that are required by the existing users in the impact region of the demonstration project. The information presented in this section will

be used to measure the incremental change caused by the demonstration project attracting construction workers and recreationalists during and after the project.

## 9. Needs of Special Populations

The existing community includes a number of special population groups that need to be specifically enunciated. These special populations include senior citizens and perhaps some minority population. If the project impacts adversely or beneficially on these special populations, then the populations, their characteristics, and their needs should be clearly identified in this section. The affect of the project on these special populations will be then addressed in Chapter 4.

### C. ECONOMIC ENVIRONMENT

#### 1. Property Values

The demonstration project may affect property values particularly for the areas immediately adjacent to the lake. These impacts may cause a decrease in property value during construction and an increase in property value after the completion of construction, or simply an increase in property value immediately. Therefore, the existing situation must be documented in detail. Assessed evaluation data available from the city could be mapped or presented in tabular form to give the reviewer a clear picture of the existing preproject situation. The discussion should address both residential and commercial properties in the project area.

#### 2. Employment

The Environmental Setting needs to present a clear characterization of existing employment in the neighborhood and in the entire city. Construction of the demonstration project will create a specific number of jobs directly attributable to the construction phase. After construction, operation of the recreational facilities will require maintenance and support staff. This employment, in turn, develops secondary or spin-off jobs in the community as the construction worker money is spent and filters through the economy. The basis of this section of the environmental impact assessment will be developed during the preparation of the benefit cost analysis and the information developed in that report should be summarized and paraphrased here. If the data developed permits identification of the impact on employment to the community adjacent to the project, then it too should be included in this section.

#### 3. Wages and Income

For each of the employment categories identified in the previous section, the existing situation with respect to wages and income should be presented on a city-wide basis and secondly, on a community basis for that portion of the city within the impact region. Later, in Chapter 4, the effect of the project can be expressed in economic terms using this section

as the baseline condition. Again, the benefit cost analysis is a likely source for the information required in this section.

#### 4. Resources and Labor

A cross section of the resources and labor available in the community and in the entire city needs to be presented in the Environmental Setting. The proposed project will require consumption of certain resources and the utilization of labor throughout the duration of the construction period and to a lesser extent, during the operation of the recreational facilities. This section needs to present the baseline condition and the resources and labor available.

#### 5. Physical Structure and Stability (Public)

Using the benefit cost analysis as the basis, a clear picture of the physical structure and stability of the city of Chicago, the park district, and other public institutions that will be affected by the demonstration project, needs to be clearly presented. Specific information concerning the capability of each institution should be presented so that in Chapter 4, the fiscal impact of the demonstration project can be identified. Included in this section should be an analysis of the agency or agencies that will be responsible for operations and construction including their historical performance in similar projects and their capability to manage this project during construction and to maintain the project after completion of the recreational facilities.

#### 6. Economic Stability (Private)

In the immediate vicinity of the project, within the impact region, the economic stability of the private sector should be characterized. Existing trends in the number of new businesses formed in the community, bankruptcies, or other indicators of economic stability, should be presented to identify the baseline condition of the private sector. Later, in Chapter 4, the impact of the demonstration project on the private sector will need to be identified. This section then includes all pertinent data necessary to identify the change that will take place.

#### 7. Priorities of Public Expenditures

A very brief analysis of how this project fits within the priorities established by city decision-makers must be included. This section should specifically list the priorities established by the city as well as identifying the criteria used to identify those priorities. This section can be brief, but it is important in providing basic information required for citizens and interest groups to evaluate how this project fits within the overall goals established by the city.

## D. CULTURAL RESOURCES

### 1. Historic Preservation Values

Using the data developed by the Illinois Coastal Zone Management Program, all areas or sites of historical interest or value should be discussed. A map of these sites and areas should be included clearly showing the relationship between these historic sites and the proposed project. A compilation of all registered national landmarks, sites, or objects, should be included.

### 2. Archeological Preservation Values

Again, using the data collected for the Illinois Coastal Zone program, inventory the archeological sites within the project impact region. It is possible that an archeological survey of the lakeshore may be required at a very early stage in the impact and the development of the environmental impact assessment. Formal contact needs to be made with the appropriate State and local archeological institutions. It is possible that one of these institutions has already conducted a survey at or near the site and could be an important informational resource. This section should also include a map showing the archeological resources within the impact region.

### 3. Aesthetic Form and Values

This section should include a brief discussion of the existing aesthetics in and near the project impact region. The relationship of the existing conditions to overall goals and objectives of the city and the community should be discussed in a few clear, concise paragraphs.

## E. URBAN INFRASTRUCTURE

### 1. Land Use Pattern

This section of the Environmental Setting should be carefully written so as to avoid being redundant with the chapter on Land Use Plans and Policies. A land use map showing existing land use in and near the project site should be included as part of the material. Narrative should explain existing land use so that later in Chapter 4, conflicts or agreement with the existing pattern can be identified.

### 2. Energy Consumption and Conservation

Disposal of the waste material generated by the deep tunnel project requires the consumption of energy. The amount of energy consumed to move the waste material from point of origin to its existing disposal site needs to be quantified. In Chapter 4, the additional energy consumption or conservation required to move the material to the demonstration project site will also need to be identified and compared to this baseline condition. In the Environmental Setting, this section

can be a short, straight forward presentation of the assumptions and methodology used to determine total energy consumption for moving the material to the disposal site.

### 3. Municipal and Social Services

The municipal and social services available in the impact region of the proposed project should be identified in the Environmental Setting. The services covered in this section are determined by the impacts identified in Chapter 4. That is, only those services that are effected by the project need to be discussed in this section. However, should there be unusually sensitive services provided within the region, Chapter 4 may also need to include a simple statement that these sensitive services will not be effected by the project.

### 4. Transportation Systems and Traffic Congestion

Lakeshore Drive and Sheridan Road are important commuter routes adjacent to the proposed project. This section should include a clear description of this important corridor and its importance to traffic movements near the project site. The existing system should be quantified as much as possible. Public mass transit systems should also be discussed emphasizing the accessibility of the project site using these energy efficient transportation modes. Existing levels of traffic including identification of areas of particular congestion should also be identified so that Chapter 4 can discuss the impact of construction traffic and recreational traffic to the project site.

APPENDIX C

PERMIT OR APPROVAL FACT SHEETS

PERMIT OR APPROVAL FACT SHEET

TIMING: 120 Days prior to operations

REVIEW PERIOD: 120 Days

TYPE: NPDES

AGENCY: Illinois Environmental Protection Agency

SUBMIT TO: Illinois Environmental Protection Agency

SUBMITTED BY: Owner/Operator

ACTIVITIES GENERATING PERMIT/APPROVAL REQUIREMENT:

Wastewater discharge to the waters of the United States.

SUPPORTIVE DOCUMENTATION:

Characterization of effluent (predicted), plans and specifications, operating procedures, data on soils and geology, groundwater location.

COMMENTS:

Not needed if entire discharge goes to a publicly-owned treatment works.

SOURCE:

William Busch, Illinois EPA, (217) 782-0610

PERMIT OR APPROVAL FACT SHEET

TIMING: Prior to construction of emission source      REVIEW PERIOD: 90 Day statutory (30 days turn-around is usual unless something presents itself as a problem)

TYPE: Construction Permit-Air Emission Source

AGENCY: Illinois Environmental Protection Agency

SUBMIT TO: Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Permits Section  
2200 Churchill Road  
Springfield, IL 62706

SUBMITTED BY: Owner/Operator

ACTIVITIES GENERATING PERMIT/APPROVAL REQUIREMENT:

Construction or modification of any emission source or air pollution control equipment.

SUPPORTIVE DOCUMENTATION:

- Process flow diagram
- Plot plan/map
- Nature of emission source and pollution control equipment including expected life.
- Plans and specs, engineering drawings - certified by Illinois Registered P.E.

COMMENTS:

- Under certain circumstances joint construction and operating permits can be issued as determined by EPA.
- For a list of application forms refer to APC-209 "Request for Permit Forms."

SOURCE:

Fred Crawford, (217) 782-2113



PERMIT OR APPROVAL FACT SHEET

TIMING: 90 Days before Operating Permit  
is required

REVIEW PERIOD: 90 Days statutory  
(30 Days normal  
turnaround)

TYPE: Operating Permit-Air Emission Source,  
Pollution Control Equipment

AGENCY: Environmental Protection Agency

SUBMIT TO: Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Permits Section  
2200 Churchill Road  
Springfield, IL 62706

SUBMITTED BY: Owner/Operator

ACTIVITIES GENERATING PERMIT/APPROVAL REQUIREMENT:

Operation of air emission source or air pollution control equipment.

SUPPORTIVE DOCUMENTATION:

- Process flow diagram\*
- Plot plan/map\*
- Nature of emission source and pollution control equipment including expected life\*
- Plans and specs, engineering drawings - certified by Illinois Registered P.E.\*
- Description of start-up procedures; duration, frequency of start-ups, types and quantities of emissions and plan to minimize start-up emissions
- Process and instrumentation diagram

\* If this information submitted for permit to construction, no need to resubmit.

COMMENTS:

- EPA may waive the 90 day requirement when appropriate
- No operating permit shall be valid for longer than 5 years after which time renewal permit must be obtained

SOURCE:

Fred Crawford, (217) 782-2113

PERMIT OR APPROVAL FACT SHEET

TIMING: Prior to Construction

REVIEW PERIOD: No statutory  
limitations if  
EIS is required -  
one to two year  
delay

TYPE: Permit to Construct or Place Fill  
Material in Navigable Waters in the  
United States

AGENCY: U.S. Army Corps of Engineers

SUBMIT TO: Chicago District  
U.S. Army Corps of Engineers  
Permits Section  
219 South Dearborn Street  
Chicago, IL 60604

SUBMITTED BY: Owner/Operator

ACTIVITIES GENERATING PERMIT/APPROVAL REQUIREMENT:

Placement of fill material on the bed of Lake Michigan, construction of breakwaters, piers, docks, and rebutments, dredging fill operations.

SUPPORTIVE DOCUMENTATION:

- Site plan/map
- Map showing bathymetry in project area
- Environmental assessment needs to be attached

COMMENTS:

- The Corps of Engineers will be the lead Federal agency in a project of this nature. This means that the review by other Federal agencies will be coordinated by the Chicago District.

NOAA COASTAL SERVICES CENTER LIBRARY



3 6668 14104 0941

COASTAL ZONE  
INFORMATION CENTER