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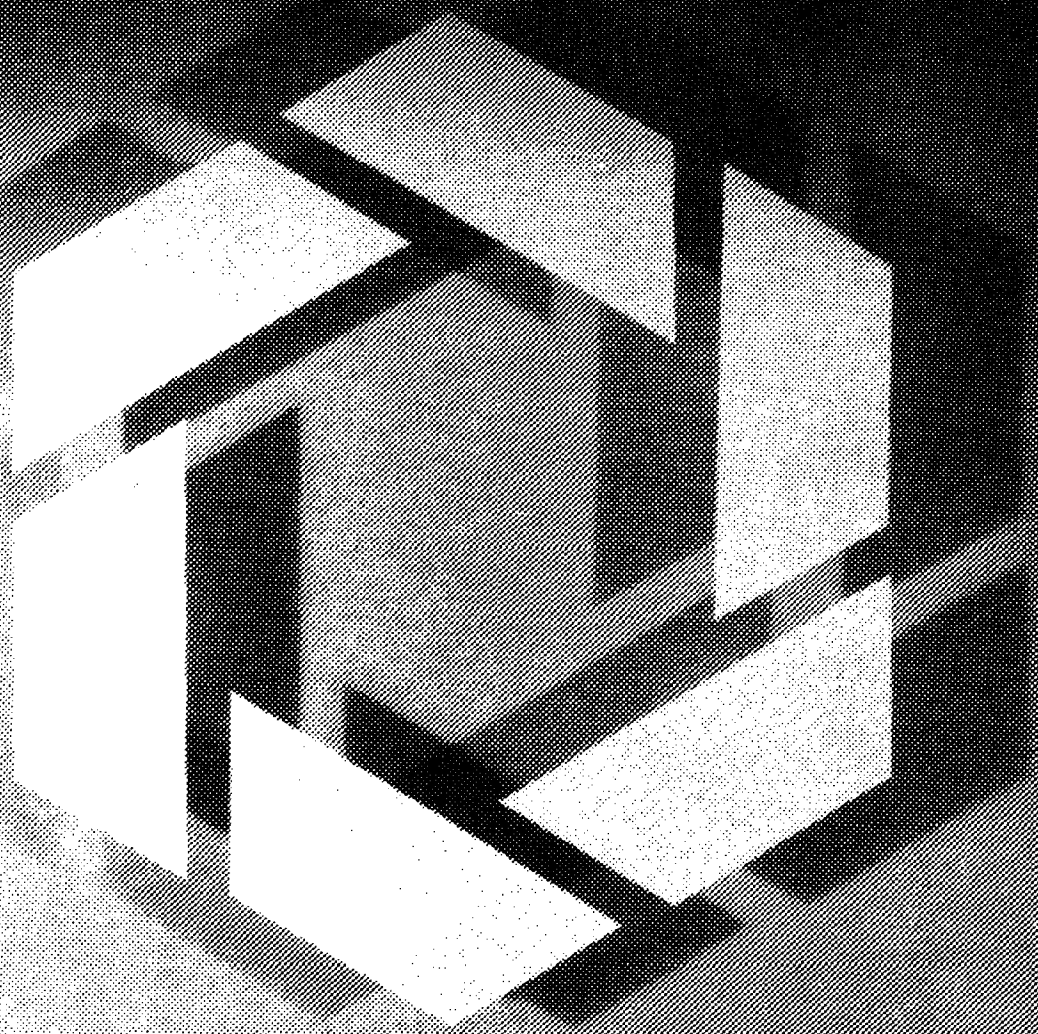

INTERIM REPORT
ENVIRONMENTAL ENHANCEMENT
OF THE
BALTIMORE HARBOR

Regional Planning Council
25 N. Charles Street Baltimore, Maryland 21218

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INTERIM REPORT

ENVIRONMENTAL ENHANCEMENT OF THE BALTIMORE HARBOR

Prepared by the Regional Planning Council with assitance from the Environmental Enhancement Task Force

The preparation of this report was in part supported by a grant from the Maryland Coastal Zone Management Program (Tidewater Administration), funds provided by the Office of Coastal Zone Management.

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SUMMARY

This interim report records the progress achieved by the Environmental Enhancement Task Force (representatives of citizens and economic and environmental agencies from federal, state, regional and local governments) on the mechanisms possible to satisfy both economic and environmental goals for the Baltimore Harbor. The Task Force, working with the Regional Planning Council staff, has described the need for a smoother, more timely permit process for dredging and filling. They also agreed that an intensified effort needs to be undertaken to improve the environmental health of the harbor as a part of the Chesapeake Bay system and as a recreation area for the Metropolitan Area. The report describes the process by which the various state and federal requirements for mitigation can be combined into a uniform policy for mitigation in the Baltimore Harbor. Initial criteria for appropriate dredging and filling projects and the conceptual basis for the mitigation policy are described in this report.

TABLE OF CONTENTS

PAGE

SUMMARY..... i

TABLE OF CONTENTS..... ii

INTRODUCTION..... 1

A. Approach to the Study..... 4

B. Management of the Study..... 5

C. Background Information..... 7

1. The Nature of the Problem..... 7
2. Existing Mitigation Policies.....11
3. Other Efforts to be Coordinated With This Study.....12
4. Activities in Other States.....17
5. Other State Mitigation Efforts.....19

D. Goals and Objectives of the Study.....20

THE FORMATION OF A COMPREHENSIVE MITIGATION POLICY.....21

A. Definitions.....22

B. Criteria for Granting Permits for Dredging and Filling in the Harbor.....23

C. Criteria for the Amount and Type of Mitigation.....25

D. Enhancement Activities Which May Be Used for Mitigation.....25

INVENTORY OF AVAILABLE INFORMATION.....26

A. Wetlands.....27

B. Shoreline and Land Use.....29

C. Water Depths.....32

THE NEXT STEPS.....34

APPENDIX A: VEGETATED MARSH TYPES OF THE PATAPSCO ESTUARY.....A-1

FIGURES

Figure 1 - Study Area Boundary..... 2

Figure 2 - Wetlands.....28

Figure 3 - Public and Private Lands.....30

Figure 4 - Study Boundary and Water Depth.....33

INTRODUCTION

This study was initiated for two purposes: to develop a process which will reduce costly delays caused by increasingly stringent dredge and fill permit requirements and to improve the aquatic habitat and public access in the Baltimore Harbor which are the reasons for these requirements. The study area encompasses the estuary of the Patapsco River (see Figure 1), including the shoreline from Bodkin Point in Anne Arundel County up to and including the Black Marsh area, at the end of the Patapsco River Neck. The western boundary will include the Patapsco River up to Route 1, (the limit of tidal influence), and the Middle Branch of the Patapsco River.

In the past, agencies charged with improving environmental quality have become involved in long, exhaustive studies and negotiations (and occasionally legal battles) when reviewing permits for fill considered necessary by the applicant and economic or public works agencies. Several causes of delays are: the legal requirements and complexity of the federal and state permit processes; the different criteria used by each agency depending on its responsibility and authority; the applicants' lack of knowledge about these requirements, processes and criteria; and lack of defined areas for mitigation of projects which meet the criteria for approval.

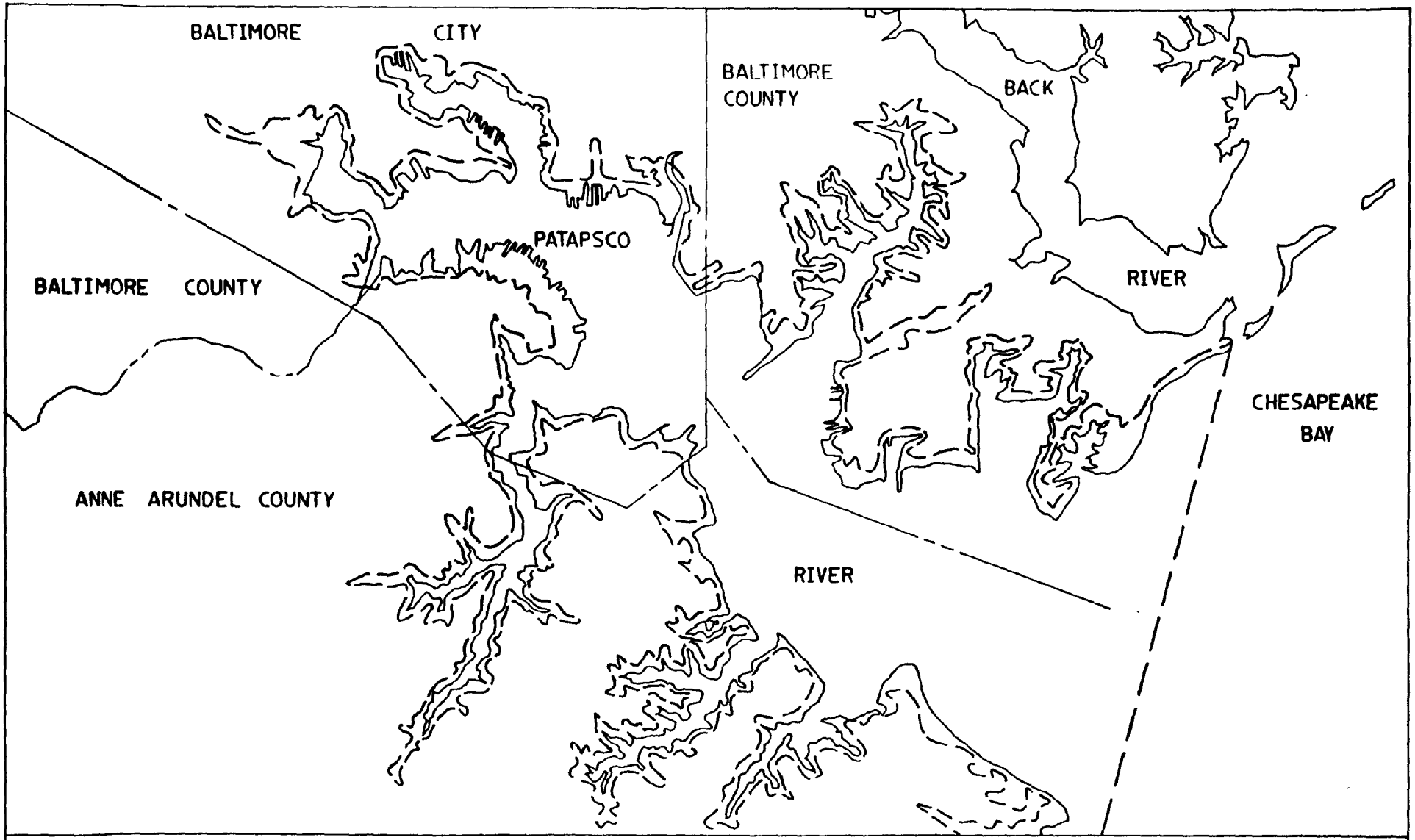

FIGURE I STUDY AREA BOUNDARY

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FEBRUARY 1981

This study, and the subsequent development of an environmental enhancement plan seek to address these concerns.

Two cases illustrate where the permit process has produced satisfactory results: the Fort McHenry Tunnel for Interstate 95 and Atlas Machine and Iron Works.

Construction of the Fort McHenry Tunnel necessitated the placement of a large volume of dredge material somewhere within the Harbor waters or at an upland location. A task force of agency representatives involved in the permit process was convened by the applicant (Interstate Division for Baltimore City) and their consultants to review potential placement sites and their design. Although the need for the tunnel was well established, the placement site preferred by the applicant was a 140-acre fill in the Harbor. Other alternatives had to be examined and evaluated and their relative suitability, cost and environmental impacts established. The Harbor fill site proved to be the best alternative when environmental and economic factors were considered. Mitigation of the open water fill was included in that alternative. The nature of the mitigation, which includes marsh creation and studies of dredged material handling, is still under negotiation. However, working with the task force, the applicant was able to secure the needed permits on the condition that such mitigation would be undertaken. This process, including the preparation of an environmental impact statement, took over two years.

The Atlas Machine and Iron Works submitted an application to the Corps of Engineers in May of 1978 for the construction of a three acre fill for a new steel fabrication plant with marine facilities on its property in Curtis Bay. After an 18-month stalemate, a roundtable meeting was called and the applicant modified their original proposal and resubmitted a compromise

plan, taking into consideration the desires of the environmental agencies. The plan specified that the applicant would reduce their fill area by one acre and develop a marshland and a tidal pool in direct compensation for the project. This process took over two years.

Recognizing that a mitigation policy would potentially accomodate both the interests of the economy and the environment while reducing the time required, the Coastal Resources Division of the Maryland Department of Natural Resources provided the Regional Planning Council with a grant to begin preparing an environmental enhancement study of the Baltimore Harbor.

Approach to the Study

This interim study has developed a proposed mitigation policy for development proposals in the Baltimore Harbor. At the same time, the Environmental Enhancement Task Force also developed a scope of work for the preparation of the Environmental Enhancement Plan. This plan will be prepared by a consultant under the direction of the Regional Planning Council, the Task Force, and the Maryland Coastal Zone Management Program.

In order to develop a mitigation policy five things had to be established:

1. Definitions of mitigation and compensation;

2. Criteria for acceptable dredging and filling in the Harbor;

3. The level of mitigation desired by all appropriate agencies with respect to development in the Harbor;

4. Agreed-upon standards for determining the amount and type of compensation if adequate mitigation is not feasible; and

5. Criteria for selecting environmental enhancement areas.

Based on the mitigation policy as proposed in this document, the Environmental Enhancement Task Force will oversee the preparation of the Environmental Enhancement Plan. This Plan will:

1. Identify and categorize areas where aquatic habitat, water quality and public access can be improved;

2. Develop management programs for each area, including intended uses, costs, timing and permit requirements; and

3. Develop a handbook/pamphlet containing standards and guidelines for small project mitigation.

These areas and their management programs could then be used by permit applicants for their mitigation programs.

Management of the Study

The Regional Planning Council has organized an interjurisdictional task force to assist in the development of the environmental enhancement plan. The purpose of the task force is to oversee the study, including: review and comment on the Regional Planning Council's work, development of fill criteria and mitigation requirements, and a developing scope of work for

the consultant study. They will meet as necessary to provide continued input, direction, and management to the Environmental Enhancement Plan development. The following persons are participants in the Environmental Enhancement Task Force:

Local Government	
Mr. David Carroll	Baltimore City Department of Planning
Mr. Charles Davis	Baltimore County Department of Planning and Zoning
Mr. Thomas Ervin	Anne Arundel County Office of Planning and Zoning
Mr. Gerald Kreiner	Interstate Division for Baltimore City
State Government	
Mr. Eduardo Acevedo	Maryland Department of Health and Mental Hygiene, Office of Environmental Programs
Mr. Thomas Dolan	Coastal Resources Division, Tidewater Administration
Mr. Lawrence Goldstein	Board of Public Works
Mr. Frank Hamons	Port Development Planning Division, Maryland Port Administration
Mr. Wayne Klockner	Maryland Department of Natural Resources, Wetland Permit Section
Mr. Harley Speir	Maryland Department of Natural Resources, Tidal Fisheries Division
Mr. Allan R. Tustin	Department of Economic and Community Development, Office of Business Liaison
Federal Government	
Mr. Ronald Gatton	National Marine Fisheries Service
Mr. Milton McCarthy	U. S. Fish and Wildlife Service
Mr. William Muir	U. S. Environmental Protection Agency, Wetlands Review Section
Mr. Jon Romeo	Army Corps of Engineers
Others	
Ms. Mary G. Dolan	Regional Planning Council
Dr. Richard Strachan	Coastal Zone Metropolitan Advisory Board

Background Information

Prior to establishing a mitigation policy, agreement must be reached regarding the nature of the problem, existing policies, other efforts to be coordinated with this study, activities in other states, and the goals and objectives of the study. This section briefly summarizes each of these.

The Nature of the Problem

Dredging and fill projects are continually altering wetlands, open water habitat and the shoreline of the Baltimore Harbor. A specific policy on mitigation will ensure that a balance is struck between economic development in the Baltimore Region and the environmental quality of the Harbor waters.

A mitigation policy would "smooth out" the permit process for development proposals. If a set of criteria that responded to and allowed for a balance between economic development and environmental quality were readily available, decisions regarding the issuing of permits could be accomplished much faster, and the costly delays in starting projects would be decreased. The ability to make tradeoffs efficiently and equitably will be a primary consideration of this mitigation policy.

While increasing the speed of the process, it is equally important to note that permit requirements were established to protect the health of the Patapsco estuary as part of the Chesapeake Bay System. If the Patapsco estuary can be improved, the Chesapeake Bay and the seafood and recreation industries which depend on its health will be enhanced. Conversely, developments which adversely affect the ecosystem can alter food chains, and change

and lower species diversity and production. In addition, the health of the people who eat the food that is produced in the degraded areas is affected, and recreational uses are limited. Recreation is a growing economic use of the Harbor's shoreline and waters. Local recreational needs of the large urban population increase rapidly as travel is reduced by the high cost of energy.

The removal of aquatic habitat for the purpose of industrial expansion and port development is a long term trend in the Patapsco River. Dredging, the excavation of bottom material and filling, the deposition of materials onto the bottom are two construction techniques widely used in the Harbor. Dredging is performed to further the following objectives: (1) to create and maintain navigable channels, turning basins, berths, marinas and recreational areas; (2) for laying pipeline or tunnels; and, (3) as a source material for fill. Filling relates to the deposition of materials for the purposes of disposal of dredged material or the creation of new fastland for commercial, industrial, or residential construction or expansion.

Within the legally defined limits of the Baltimore Harbor, applications for permits have been received by the Corps of Engineers for the creation of approximately 600 acres of new land since 1975. In one example, Bethlehem Steel filled 23 acres in 1975, presently has an application for the filling of 45 acres, and has plans for filling an additional 105 acres. The creation of a spoil disposal site for the Fort McHenry tunnel will remove 137 acres of open water habitat. Total projected dredging requirements both new and maintenance projects within the Baltimore Harbor*

*The tidal portions of the Patapsco River enclosed by a line from North Point to Rock Point.

over the next 20 years are approximately 57.6 million cubic yards of material. Filling, dredging, and the placement of dredge material have a variety of environmental impacts.

Filling and dredge material placement have similar environmental consequences, including those described below:

1. Current patterns, velocities, and volumes transported as well as sedimentation characteristics of adjacent areas may be altered.

2. Free tidal flow may be blocked or impaired which will usually lead to increased sedimentation of finer sediments, resulting in an ultimate alteration of habitat type and tidal height of adjacent tidal areas. A ramification of the displacement of loose sediments is the possibility of release of pollutants. This will affect the water quality as well as the biological communities in the area of the proposed fill.

3. A volume of water within the Harbor will be displaced, decreasing the Harbor's capacity to assimilate wastes within the Patapsco River.

4. The amount of life that can be supported by a given habitat (carrying capacity) may be decreased.

5. Detrimental changes may occur in the habitat for fish and wildlife, particularly in the immediate locality of the discharge. For example, migration routes or access to select food sources can be blocked or restricted.

6. Mud waves can be created as heavy fill materials are placed on soft sediments. These, in turn, can alter adjacent habitats and damage other structures.

7. In vegetated wetlands, filling results not only in direct loss of habitat for fish and wildlife but also the loss of other important functions vegetated wetlands provide. These functions include protection against shoreline erosion, storage of flood surges, and reduction of sediment and pollutant loads.

Dredging also implies certain significant environmental impacts most of which are temporary:

1. Feeding and breeding grounds of fish, shellfish, and wildlife may be destroyed.

2. Sediments may be resuspended into the water, smothering plants and other aquatic life. Toxic materials adsorbed into the sediments (i.e. heavy metals, pesticides, etc.) may also be released into the water.

3. Short and long term changes in water currents, circulation, mixing, flushing, and salinity may be initiated adding to turbidity and lowering the dissolved oxygen content of the water.

4. Normal erosion and sediment transport may be increased.

With the development of a comprehensive policy on mitigation, dredging and filling activities can be mitigated in a logical manner. It will be possible to serve the needs of the people of the Baltimore Region while minimizing the adverse affects of development on the ecosystem. Conservation and enhancement of significant coastal resources (i.e., wetlands, beaches, wildlife habitat areas, existing public recreation areas, and historic, cultural, or archeological resources) are supportive of a healthy economy.

Existing Mitigation Policies

Federal

There are currently two federal agencies that have an "active" mitigation policy: The U. S. Fish and Wildlife Service (Final Draft dated May 1, 1980) and the U.S. Army Corps of Engineers (March 12, 1980). The main emphasis of the Fish and Wildlife Service policy is to "seek mitigation for the benefit of all people when land and water developments result in direct and indirect loss of fish and wildlife population." The Corps of Engineers policy on mitigation centers on evaluating the advice, recommendations and conclusions of the fish and wildlife agencies which estimate the costs and benefits of the proposed water resource project. The Corps of Engineers is

authorized to add special conditions (mitigation measures) to permits as a way of avoiding or mitigating impacts on fish and wildlife values which are associated with the construction and operation of the project.

Both these documents have the potential for helping to establish a comprehensive, specific and enforceable policy on development activities in the Baltimore Harbor. However, these two policies alone will not be sufficient. The U. S. Environmental Protection Agency does not have a formal mitigation policy, but they do evaluate each case on an individual basis and recommend that certain mitigation or compensatory measures be taken, depending on the nature of the project. Without a coordinated effort from all agencies involved, fragmented and vague mitigation standards will continue to frustrate the efforts of those seeking to improve the Harbor waters.

State

The Maryland Board of Public Works assesses compensation at the rate of one-third of the fair market value of the land created for purchase of state property (land below mean high water) for filling. Although these funds are used by the state for wetlands acquisition (usually outside of the Patapsco estuary), they are not intended to serve as mitigation for lost resources. The Board has not yet attached a value to the removal of aquatic habitat.

Other Efforts to be Coordinated With This Study

The following programs or studies in Maryland are attempting, in one way or another, to deal with development activities and their direct and indirect impact on the

Baltimore Harbor. In the context of the Environmental Enhancement Study, we will work with each of these programs when developing an overall policy on mitigation. This study is undertaken as part of a larger effort by all involved to smooth out the permit process.

Five Year Dredging Program

The Maryland Port Administration is preparing a five year estimate of necessary dredging, dredged material placement sites and capacities. This program will be updated every year and will specify time frames, applicants, and dredging estimates within and outside the Baltimore Harbor.

Maryland Port Administration Sediment Studies

The Maryland Port Administration is continuing to explore the feasibility of Baltimore Harbor dredged material placement sites with studies of the engineering qualities of the sediments at proposed sites. This data will be integrated with the background information when it is received.

- I-95 Fort McHenry Tunnel Project

  The Interstate Division for Baltimore City (IDBC) will be utilizing 137 acres of open water habitat at Canton/Seagirt to contain an estimated 3,343,000 cubic yards of materials dredged to construct the Interstate 95 Fort McHenry Tunnel. As mitigation for the losses of intertidal and submerged wetlands habitats that will be incurred as a result of the project, the IDBC is considering a plan to introduce new and productive marsh areas within the Baltimore Harbor. This type of resource enhancement plan would be in compensation for loss of aquatic habitat caused by the permitted action.

- Reuse/Recycling Study

  The Interstate Division for Baltimore City, acting as an agency of the Maryland Department of Transportation and State Highway Administration, in cooperation with the Maryland Department of Natural Resources, is beginning a study that will determine the feasibility of establishing a permanent dredged material reuse/rehandling facility in Baltimore Harbor. This study will also identify environmental problems and solutions for mitigation of alternative methods of dredged material placement and reuse/rehandling.

- Coastal Energy Impact Program

  A Coastal Energy Impact Program (CEIP) Study undertaken by Baltimore City is examining the physical,

social, and economic impacts of new and expanded energy facilities which impact the coastal zone of the Baltimore Harbor. This project also involves the identification of means of preventing and ameliorating losses to environmental and recreational resources which have sustained impact from these facilities.

Baltimore City has also secured CEIP funds for the mitigation of impacts associated with energy facility development. For example, in one current program, mitigation is planned for both the Fairfield Homes and Reedbird Park which have sustained impact from the movement of coal for export and trucking from storage tanks in Fairfield.

- Hawkins Point/Marley Neck Joint Development Project

  This study is exploring the feasibility of development for one of the largest tracts of undeveloped industrially zoned land on the East Coast--the Hawkins Point/Marley Neck Peninsula. In addition to economic and infrastructure studies, adverse impacts of development proposals are being considered at the preliminary stages of planning.

- Water Quality Management Planning (Section 208) and Jones Falls Urban Runoff Program

  The Baltimore Regional Water Quality Management Plan, prepared in 1978 and revised in 1979 and 1980, focuses on non-point sources. The Maryland Department of Health and Mental Hygiene administers the National Pollutant Discharge Elimination System

Permit Program which monitors and regulates point sources in the Baltimore Harbor and throughout the state. In addition, a special grant was received by the Regional Planning Council through the National Urban Runoff Program to study non-point source pollution in the Jones Falls, a major source of fresh water to the Harbor. This study should result in improved knowledge about the contribution of non-point sources to the overall pollutant load in urban rivers, and especially in the Jones Falls. Sediment loads will be addressed which may shed some light on the contribution of non-point sources to sedimentation of shipping channels.

- Aquatic Critical Areas

The Living Aquatic Resources Task Force, a subcommittee of the Coastal Resources Advisory Committee, is charged with identifying certain "aquatic critical areas" in the Bay and its tributaries that are vulnerable to development. These areas could include: finfish spawning areas, oyster bars, seed areas, and crab shedding grounds. By identifying sensitive resources, these designations of aquatic critical areas can be considered in developing an overall mitigation policy.

Activity in Other States

- California

  The 1976 Coastal Act established six regional and one state commission to work with the general public, local governments, landowners, and developers to plan for the conservation and development of the coastline.

  Proposed development projects are permitted only if certain criteria are met, including the "maintenance of the existing functional capacity of the wetlands" and the absence of any "less environmentally damaging alternative," among others. The Act requires that for any diking, filling, or dredging for which there is no feasible, less environmentally damaging alternative, "feasible mitigation measures must be provided to minimize adverse environmental effects." The Commission will usually require as mitigation the aquisition of a restoration site which is an equivalent area in terms of equal or greater biological productivity. To meet this requirement the area must provide equivalent or greater habitat values to the same type and variety of plant and animal species which use the area affected by the proposal. If an appropriate restoration site is not available (i.e., the applicant could not find a willing seller for any restoration wetland or estuarine area), an "in-lieu" fee sufficient to provide an area of equivalent productive value shall be dedicated to a public agency, or equivalent surface area shall be dedicated to an appropriate public agency." [Section 30706.1, California Coastal Act, 1976.]

When feasible, the Commission may require the restoration of at least four units of habitat for every unit altered or destroyed (i.e., 4:1 mitigation). The type of restoration program preferred would involve the removal of fill from a formerly productive wetland or estuary area which had been filled. The total number of acres of each habitat type in the coastal zone should be maintained or increased.

In addition, the applicant is responsible for the preparation of a management plan for the site which provides for maintenance of the restored habitat in perpetuity, and evaluates the effectiveness of the mitigation.

o Oregon

The mitigation of Goal 16 of Oregon's Coastal Zone Management Program (The Estuarine Resources Goal) is a recognition of the valuable biological, economic, recreational, and aesthetic benefits which accrue from Oregon's estuaries. Goal 16 requires the identification of restoration sites as a part of the estuarine planning process. Compensation for the effects of approved dredged or filling activities involves restoration of the original attributes of estuaries lost as a result of past alterations, activities, or catastrophic events. Mitigation can be accomplished through the restoration of a lost resource, the creation of a new resource or the enhancement of an existing resource.

Three general priorities are set forth for creating or restoring estuarine areas. First, developers are directed to areas in the general proximity to the project site and areas with "similar biological potential." Second, if no area exists, locations in other parts of the estuary which have similar characteristics (i.e., salinity, tidal exposure and elevation, substrate type, slope, etc.) to the area being dredged or filled are identified. Finally, if neither of these areas are available, mitigation efforts should seek to restore areas or resources "which are in the greatest scarcity compared to their past abundance and distribution." As a result of having problems in implementing the "similar biological potential" requirements and difficulties in operationalizing other standards, legislative action ensued and House Bill 2619 of the Oregon Legislative Assembly was enacted as of June 30, 1979. This bill specifies what is to be considered when mitigating a project and when the mitigation requirements may be waived in part.

Other State Mitigation Efforts

The Port of Seattle, as compensation for filling between finger piers and removing 10 acres of waterway, is providing funds and engineering assistance to the Washington State Department of Fisheries (WDF) for the development of a public fishing pier adjacent to Port property.

In a second example, the Tampa Port Authority has implemented a temporary "environmental protection

service charge" of 2 cents per ton on all export cargo until revenues of $5 million are collected, the amount earmarked for mitigation projects in conjunction with the Corps of Engineers Tampa Harbor Deepening Project.

As a final example, the Columbia River Estuary Study Task Force (CREST) is discussing the concept of a "mitigation bank" of potential sites for replacing biological productivity lost by dredged material disposal. Under this program, state and local governments bordering the estuary would contribute funds to acquire sites which would be selected according to the type and level of biological productivity possible. Users of disposal sites whose biological productivity is reduced would purchase a "given number of replacement units of biological productivity" from the mitigation bank. This revenue is used to acquire additional mitigation sites.

Goals and Objectives of the Study

GOAL 1: To develop a clear policy on mitigation for dredge and fill proposals in the Baltimore Harbor, and a determination of when compensation is appropriate.

OBJECTIVES:

1. To define the level of mitigation desired by all appropriate agencies with respect to development in the Harbor;

2. To revise the criteria for acceptable filling in the Baltimore Harbor;

3. To identify criteria for potential sites for environmental enhancement; and

4. To set forth standards for determining the amount of compensation for environmental or habitat loss associated with open water fill projects if direct mitigation is not feasible.

GOAL 2: To prepare an Environmental Enhancement Plan for the Baltimore Harbor.

OBJECTIVES:

1. To identify a variety of potential sites and techniques for possible improved aquatic habitat and/or public access that would compensate for the loss of aquatic habitat through dredging or filling of Harbor waters.

2. To categorize these potential areas in terms of shoreline types, ownership, zoning, water quality, and potential uses for enhancement.

3. To develop guidelines for small project mitigation.

THE FORMATION OF A COMPREHENSIVE MITIGATION POLICY

The formation of a comprehensive mitigation policy is based upon the agreement of all regulatory agencies on definitions of appropriate terms, criteria for acceptable fill or dredging, the level of mitigation required for each type of resource

lost, standards for determining compensation if mitigation is not feasible, and criteria for selecting environmental enhancement sites to be used for mitigation or compensation.

Definitions

For the purposes of this study, the following terms are defined:

1. compensation - exchange of money, lands or facilities equal to the approximate cost of adequate mitigation to be used for mitigation of a particular project.

2. development - includes the placement of fill; construction or alteration of any structure or facility; discharge of any waste material, dredging or extraction of any material; a change in the density or intensity of use of land; and other alterations in the land and water in the coastal zone.

3. enhancement - improvement or development of resource values resulting in a net increase of resources over existing conditions.

4. mitigation - avoiding the impact by not taking an action; minimizing impacts by limiting the action; rectifying the impact by restoring the affected environment; reducing the impact by preservation and maintenance operations; and compensating by replacing or providing substitute resources.

5. public access - the right or means of approach; thus, public access to the shoreline means the right or

means of the general public to approach and use the shoreline.

6. restoration - revitalizing, returning or replacing original attributes and amenities such as natural biological productivity, aesthetic and cultural resources, which have been diminished or lost by past alterations, activities, or catastrophic events, to a level which can be easily maintained given current environmental conditions.

7. water dependent use - a use that cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operation.

Criteria for Granting Permits for Dredging and Filling in the Baltimore Harbor

To receive approval, each dredge or fill application to the Corps of Engineers and the Water Resources Administration for projects within the Baltimore Harbor must meet the following criteria:

1. The proposed project must meet a demonstrated public interest (i.e. net increase in employment, tax base, taxes, open space, etc.). (Storage not necessarily permitted.)

2. The proposed project must be the most practicable alternative considering both the environmental and economic resources. (To be determined by critical review.)

3. The proposed project must minimize to the maximum extent possible, the amount of

dredging and/or filling and the total adverse environmental impacts which can be expected.

The Corps of Engineers review, which includes the federal environmental and resource agencies, also applies a fourth criteria:

4. The project must be water-dependent (considering the scarcity of developable shoreline in the Harbor). The only exceptions to be considered would be existing non-water-dependent uses which must demonstrate that there are no reasonable alternatives for landward expansion.

In addition to meeting these criteria, information for many other considerations and components of the environmental impact determination must be provided by the applicant. A questionnaire or checklist should be developed to solicit this information from the applicant in a systematic way. This document should show clearly why the information is needed and the range of answers which are acceptable.

When this information is assembled, the reviewing agencies determine (on a case-by-case basis) if the proposed project satisfies the criteria. If there is no dispute, mitigation or compensation for filling is negotiated by the applicant and the agencies. A rational method for determining the amount of mitigation or compensation to be required is now being prepared (see next section for preliminary concepts).

In cases where the agencies' review finds projects which are questionable, a roundtable meeting will be held with the applicant to determine what changes can be made in the project to

meet the criteria listed above. Any exceptions, such as the existing uses mentioned in criteria number 4 above, must demonstrate a high degree of public interest or benefit. If this is not demonstrated, the permit will in all probability be denied. If the project is changed or an exception granted, the same method for determining mitigation or compensation mentioned above would be applied.

Criteria for the Amount and Type of Mitigation

These criteria and the procedure for their use are currently being developed by the Environmental Enhancement Task Force. The state and federal agencies are agreed that any method must be coordinated through the state's existing compensation programs. Mitigation, or compensation for impacts, should be tied to the cost of replacing lost habitat and to the existing guideline of one-third the assessed value of the land created. The applicant may complete a mitigation or compensation project based on the amount required by the reviewing agencies, or the money may be collected by the state to complete portions of the Environmental Enhancement Plan. In this way, money from smaller projects may be accumulated for more extensive compensation projects suggested by the plan.

As noted above, these criteria and procedures will be developed in detail and an implementation plan will be included in the final report. The final report will also include the Environmental Enhancement Plan.

Enhancement Activites Which May Be Used for Mitigation

The following is a partial list of potential enhancement activities:

1. restoration of fish and wildlife habitat;

2. improvement of water quality where it restricts the use of the Habor waters for fish and shellfish harvest and production, and for human recreation;

3. improving public access and water-oriented recreation opportunties and the quality of facilities;

4. removal of old, floating, or sunken boats, barges, derelict piers, and structures, etc., where these may adversely affect the aquatic environment, navigation, or aesthetic resources (with proper consideration of historic qualities);

5. establishment or rehabilitation of sediment control measures, both structural and non-structural;

6. rehabilitation or establishment of shoreline protection in areas of heavy erosion;

7. improvement of fish spawning areas and nurseries through the establishment of submerged aquatic grasses.

INVENTORY OF AVAILABLE INFORMATION

One area of particular concern in the Environmental Enhancement Study has been the identification of specific areas in the Baltimore Harbor which (1) may have significant environmental, cultural, economic, historic values, etc., and (2) areas which may have the potential for restoration, enhancement, or public access. The following types of information were inventoried and should enable the task force and the consultant to determine criteria and potential for environmental enhancement:

wetlands, spawning areas, shoreline land utilization and zoning, topography, water depth, and public/private property ownership.

Wetlands

The five categories used by Maryland to classify wetlands are described in Appendix A.

Anne Arundel County has an abundance of wetlands (see Figure 2) which must be protected from the adverse impacts of development. Degraded wetland areas should be identified by the consultant in the next phase of this study, and should be restored where feasible, possibly as part of mitigation plans for filling and dredging projects. Principal wetland sites in this jurisdiction include areas at: the heads of Stony Creek, Nabbs Creek, Cox Creek, Marley Creek, Furnace Creek, and Back Creek. The majority of the vegetation in all of these areas fall into either the Brackish High Marsh or Brackish Low Marsh category, or both.

An analysis of the location of wetland sites in Baltimore County also indicates that there are a considerable number of these vital areas. There are heavy concentrations of wetland areas in the vicinities of Black Marsh, Shallow Creek, North Point Creek, and Jones Creek. The primary types of vegetation at these sites are in the Fresh Marsh and Brackish Low Marsh categories. Brackish high marsh vegetation is also found, but not nearly to the extent of the vegetation types in the aforementioned categories. There are also a number of wetlands in Bear Creek. Principal locations include sites at: the head of Bear Creek, in the vicinity of Charlesmont Park, Chink Creek, Lynch Cove, Bullneck Creek, Schoolhouse Cove, and Country Club Cove. The vegetation in Bear

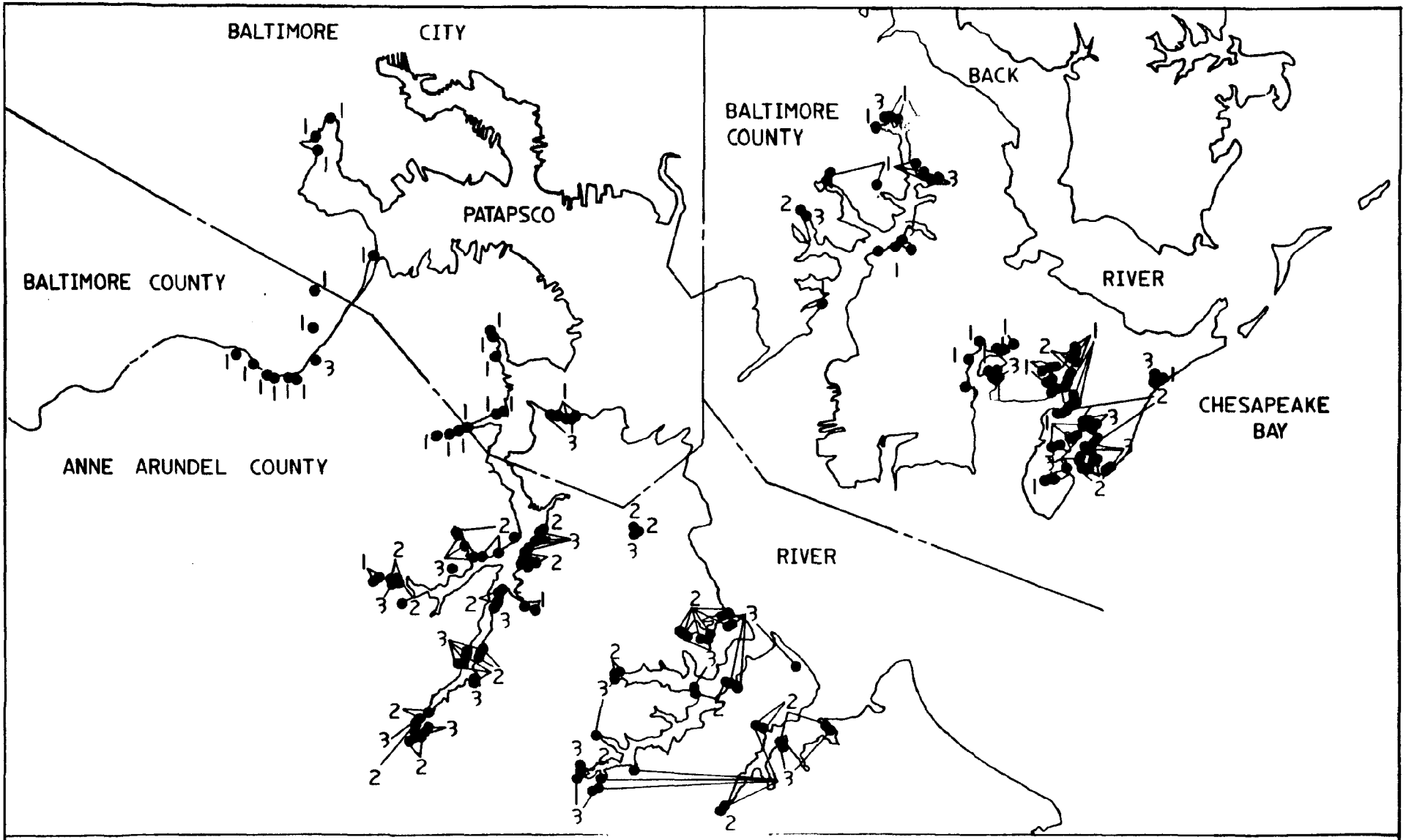

FIGURE 2 WETLANDS

- •1 FRESH MARSH
- •2 BRACKISH HIGH MARSH
- •3 BRACKISH LOW MARSH

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BALTIMORE HARBOR ENVIRONMENTAL ENHANCEMENT STUDY

FEBRUARY 1981

Creek is, for the most part, included in the Fresh Marsh category. Also, the majority of the wetland areas in the Patapsco River valley (which borders Anne Arundel County and Baltimore County) contains primarily Fresh Marsh Vegetation.

Baltimore City has the fewest number of wetland sites in the study area. There are three principal locations in Curtis Creek, the head of the Middle Branch, and the mouth of the Patapsco River at Reedbird Park. Similar to the Baltimore County wetland sites, Baltimore City's vegetation is largely in the Fresh Marsh category.

Shoreline Uses

Anne Arundel County's harbor shoreline contains (see Figure 3) three principal classes of land use: heavy industry, residential usage, and open space and recreational areas. A large part of Marley Neck peninsula is zoned for heavy industry. One of the aspects the Environmental Enhancement Plan should examine is the feasibility of creating additional areas where the public may have access to the harbor shoreline on this peninsula.

The following areas in this jurisdiction are principally occupied and are zoned for residential usage: all shoreline areas south of Rock Point to Bodkin Point; the Rock Creek, Riviera Beach, and Stony Creek areas; and the shoreline of the Glen Burnie area (includes the southern shorelines of Furnace Creek extending to the western shoreline of Marley Creek).

The third principal usage in Anne Arundel County is that of open space and community recreation areas. Fort Smallwood Park (owned and maintained by Baltimore City)

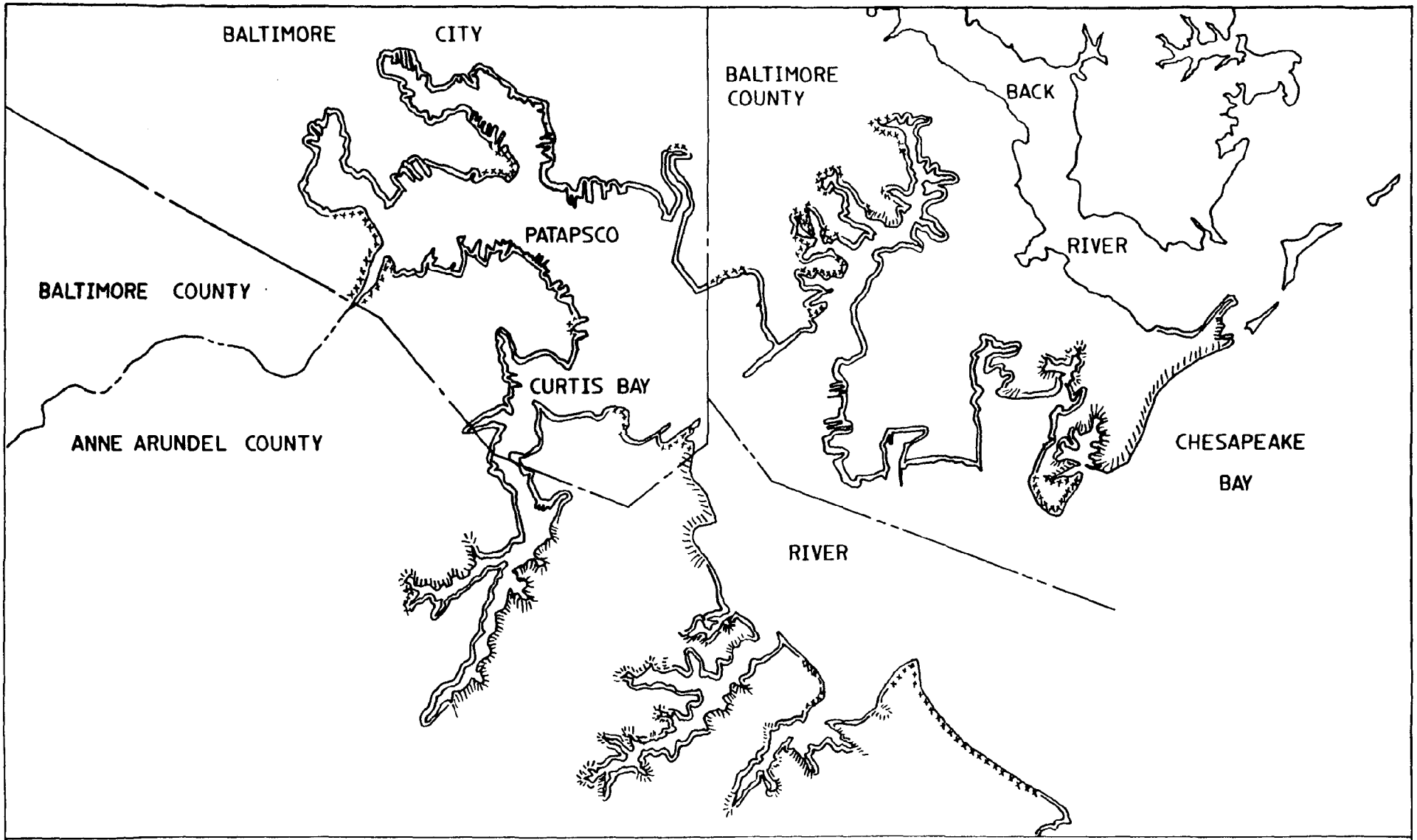

FIGURE 3 PUBLIC AND PRIVATE LANDS

xxxxx PUBLIC OR COMMUNITY OPEN SPACE

UNDEVELOPED LAND (PRIVATE)

DEVELOPED LAND (PUBLIC & PRIVATE)

REGIONAL PLANNING COUNCIL

BALTIMORE HARBOR ENVIRONMENTAL ENHANCEMENT STUDY

FEBRUARY 1981

is the only publicly owned open space area which abuts the harbor shoreline in this jurisdiction. Of course, there are other available recreation facilities on the Anne Arundel County-Baltimore Harbor shoreline, but they are either privately owned (i.e., marina facilities), or community beach areas (which allow only the residents in the specific community to use the beach area and excludes others).

An examination of the shoreline land use in Baltimore City reveals that there are two principal usages in this jurisdiction: industrial and public open space/community recreation uses. A very small percentage of Baltimore City's harbor shoreline is devoted to either residential or commercial uses. For the most part, Baltimore City's waterfront is used for industry. Usage and/or zoning for heavy industry can be found in the following areas: the large tracts of industrially zoned vacant land in the Marley Neck area; to the north and west of the Marley Neck area, the Fairfield and Brooklyn area; the South Baltimore Areas (north and east of the Middle Branch is mostly industrialized); the Fells Point and Canton shoreline; Colgate Creek, and Dundalk Marine Terminal. The Baltimore City shoreline has the following open space/community/recreation areas: Fort Armistead Park; the Middle Branch Park System; and at Fort McHenry, Fells Point and the Inner Harbor.

The Baltimore County portion of the harbor shoreline is also predominantly used for industry. The Dundalk Marine Terminal, Sollers Point, and the Sparrows Point area (owned by Bethlehem Steel), are totally industrial. The remaining areas of the Baltimore County harbor shoreline are divided between residential and public open space/community recreation uses. Residential uses are

concentrated in the following areas: at the Dundalk shoreline, along Bear Creek; at the head of Bear Creek and points extending south of the North Point community; to the east of Jones Creek, the shoreline along Old Bay Road; to the east of North Point Creek; and in the Fort Howard area.

There are many opportunities for waterfront public access in Baltimore County. This jurisdiction contains a number of private and public open space/community recreation sites; the majority of which front on Bear Creek. The opportunities that exist for public access in Baltimore County include: the Sparrows Point Country Club (private), Flemming Park, to the north of Coffin Point; Peachorchard Park, in Peachorchard Cove; Concrete Homes Park, Merritt Point Park, and Chesterwood Park, in Bullneck Creek; Lynch Cove Park and Inverness Park along Lynch Cove; Charlesmont Park and Bear Creek Park, at the Head of Bear Creek; Battle Grove Park, in Schoolhouse Cove; and lastly, at Fort Howard Park. Baltimore County also has several private marinas and community beach areas which provide public access.

Water Depths

The depth of the water in the Baltimore Harbor is, for the most part, very shallow (12 feet or less). The deep water areas in the Harbor (18 feet or greater) are set aside for anchorage and channels, which are in the general vicinity of heavy industries. This information (see Figure 4) provides us with potential areas where marsh creation and other enhancement activities may take place.

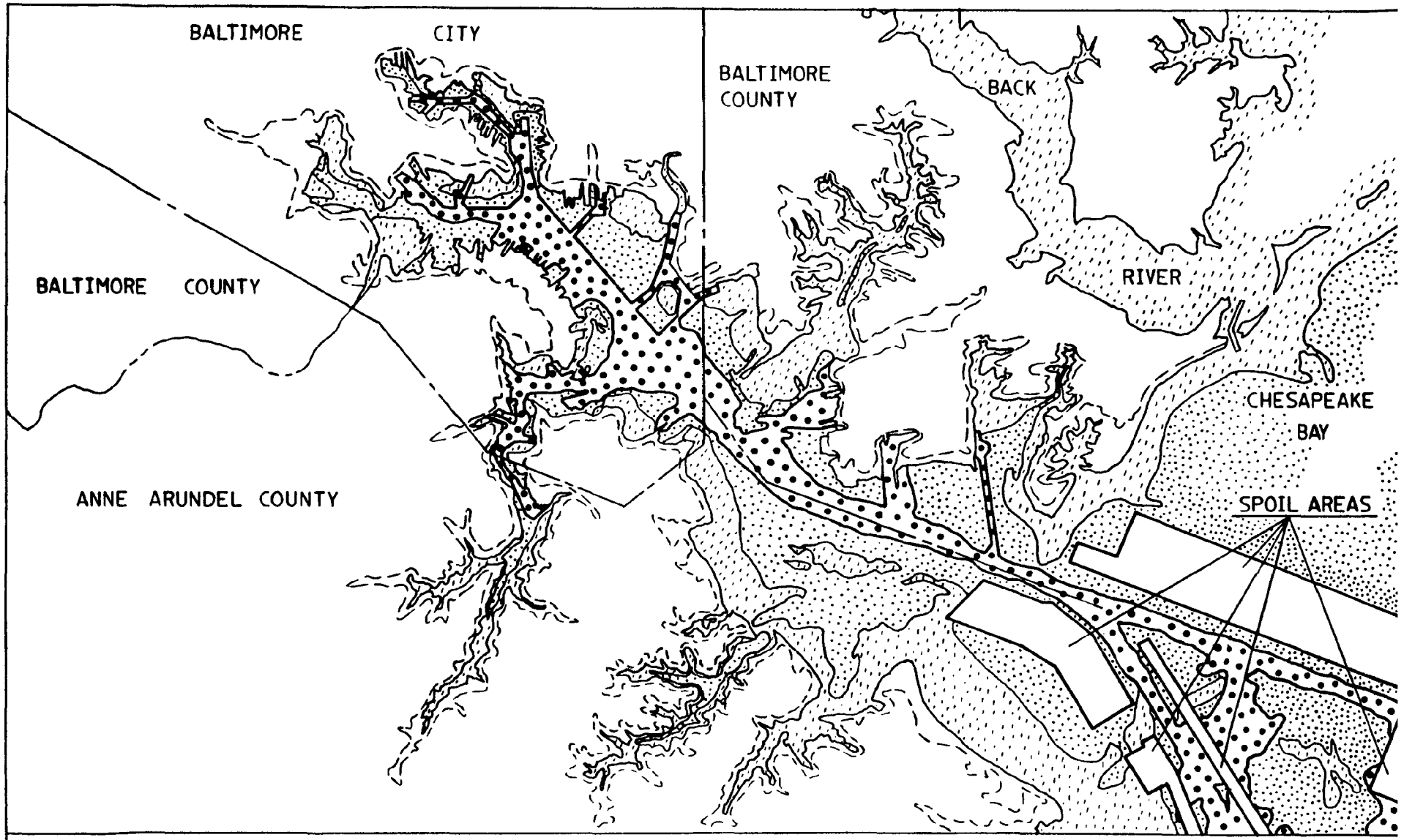

FIGURE 4 STUDY BOUNDARY AND WATER DEPTH

STUDY BOUNDARY (10' LAND ELEVATION)

0-12'

12'-18'

18' OR MORE

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BALTIMORE HARBOR ENVIRONMENTAL ENHANCEMENT STUDY

FEBRUARY 1981

THE NEXT STEPS

The need for both environmental enhancement and economic development are evident in Baltimore Harbor. The Environmental Enhancement Task Force has worked to develop an approach that will satisfy both these needs. The groundwork has been completed for the approach described in this document, and the next steps include the preparation of the technical information regarding appropriate environmental enhancement activities and development of an agreeable implementation program.

The technical study will be carried out by a consultant under the direction of the Environmental Enhancement Task Force. The study will locate appropriate sites, develop conceptual site plans and cost estimates. Sites will be ranked within categories to determine which projects are going to provide the most benefit.

At the same time, the Environmental Enhancement Task Force will work with each agency responsible for permits, planning, or enforcement to refine the criteria developed in this report, agree on a mitigation policy, and develop an appppropriate procedure for implementing the policy.

APPENDIX A

VEGETATED MARSH TYPES OF THE PATAPSCO ESTUARY

The three types of vegetated wetlands mentioned in Chapter III and Figure 2 which predominate in the Patapsco estuary are described below:

Fresh Marsh

Fresh tidal marshes occur in waters whose salinity is typically less than five parts per thousand (ppt) during the period of the lowest freshwater influx (the autumn). These marshes are often quite diverse, although monotypic stands of cattail, marsh mallow, or other species can occur. Wildlife food plants are frequently abundant. The dominant wetland plants in these marshes include smartweeds, 3-square, common reed, pickerelweed, arrow arum, wildrice, big cordgrass, and sweetflag. These marshes can be very productive, and large amounts of biomass are exported from well-flooded marshes to provide a basis for estuarine food webs.

Brackish High Marsh

This category includes the tidal marshes generally above the mean high water lines and in waters whose salinity is greater than or equal to five ppt. Plant diversity is less than in fresh marshes, and monotypic stands are common. The dominant plant species include saltmeadow cordgrass, saltgrass, marsh elder, groundselbush, cattail, common reed, three-square, and big cordgrass.

Brackish Low Marsh

These marshes are usually found adjacent to brackish high marshes but are below the mean high water lines and thus are flooded twice daily. The dominant plant is saltmarsh cord-

grass. These marshes are productive and are a major source of detritus for estuarine food webs.

In addition, two other kinds of vegetated marshes occur only occasionally in the study area.

Shrub Swamp

The shrub swamp category includes these vegetated tidal wetlands dominated by woody plants less than 20 feet in height. These wetlands occur in predominantly fresh water near the heads of tidal rivers and as transition areas between tidal marsh, wooded swamps, and floodplains. Shrub swamps can be quite diverse and often contain valuable wildlife food plants. The dominant plant in shrub swamps are swamp rose, alder, willow, and red maple.

Wooded Swamp

The wooded swamp category includes those vegetated tidal wetlands dominated by woody plants greater than 20 feet in height. Like shrub swamps, these swamps occur in fresh waters along the upper reaches of tidal rivers. Wooded swamps are quite diverse and are usually dominated by red maple and green ash.

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