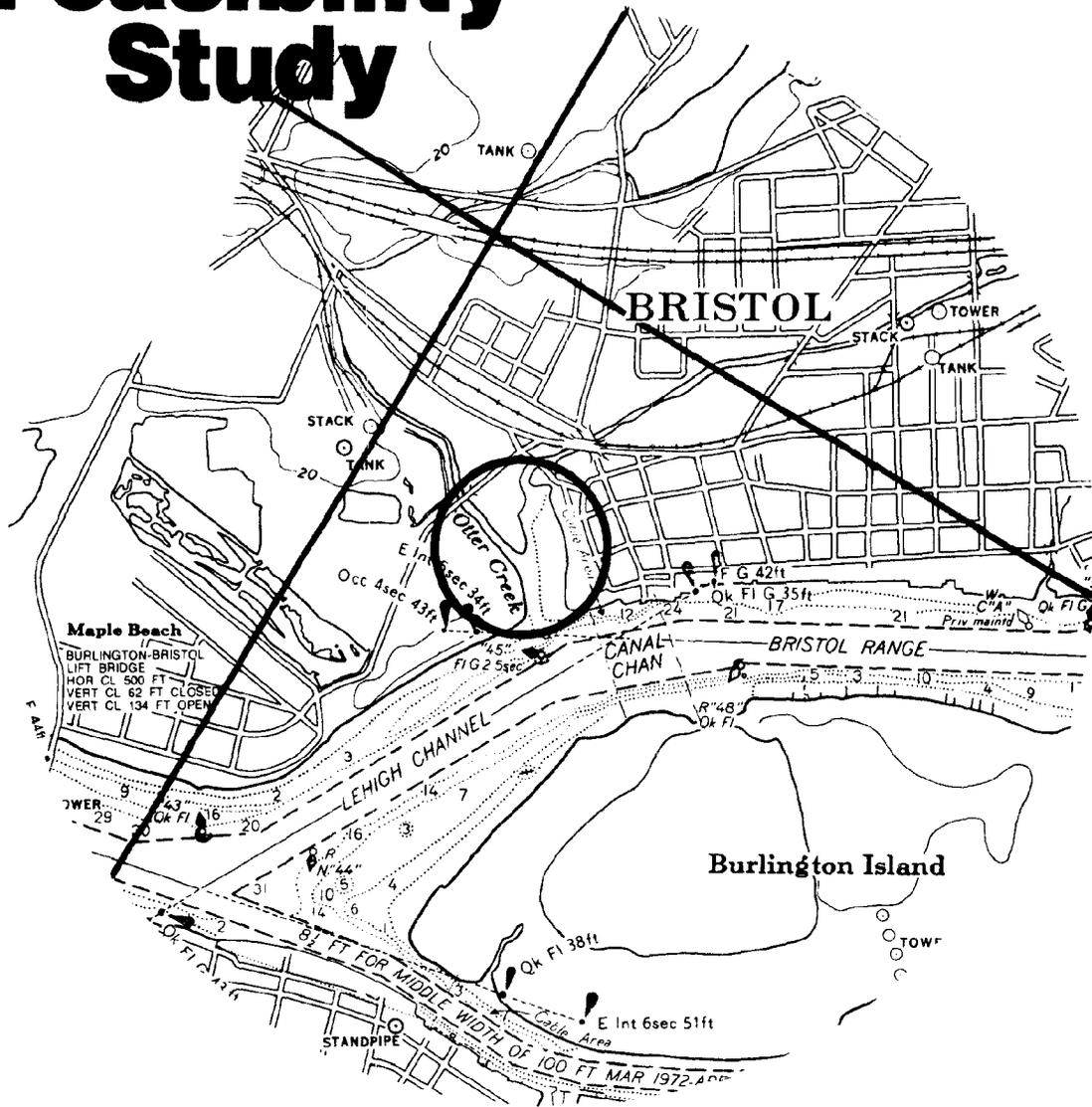

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Bristol Borough, Pennsylvania

Otter Creek Marina Feasibility Study



IMPLEMENTED BY THE PA. DEPT. OF ENVIRONMENTAL RESOURCES
UNDER THE PA. COASTAL ZONE MANAGEMENT PROGRAM

DIRECTION ASSOCIATES....CONSULTANTS....SPRING HOUSE, PA.

Pennsylvania, Department of Environmental Resources

N.P.

Pennsylvania, Department of Environmental Resources W.P.
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OTTER CREEK
MARINA FEASIBILITY STUDY,
BRISTOL BOROUGH,
BUCKS COUNTY, PENNSYLVANIA

DIRECTION ASSOCIATES, INC.

PLANNING CONSULTANTS

MIDDLE ATLANTIC STATES ENGINEERS

CONSULTING ENGINEERS

Funding for this study is provided by the Federal Government through the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration under Section 305 of the Coastal Zone Management Act of 1972 (P.L. 92-583) acting through the Pennsylvania Department of Environmental Resources, Office of Resources Management.

BRISTOL BOROUGH

MAYOR: Margaret Stakenas

BOROUGH COUNCIL: Joseph Coffman, President
Gary Tosti, Vice President
George Pirollo
William Pezza
Rose DiGuiseppe
Thomas Corrigan
Thomas Harris
Margaret Mossbrook

PROJECT
COORDINATION: Fidel Esposito, Borough Manager,
Borough of Bristol.

Ken Kugel, Planner,
Bucks County Planning Department.

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INTRODUCTION

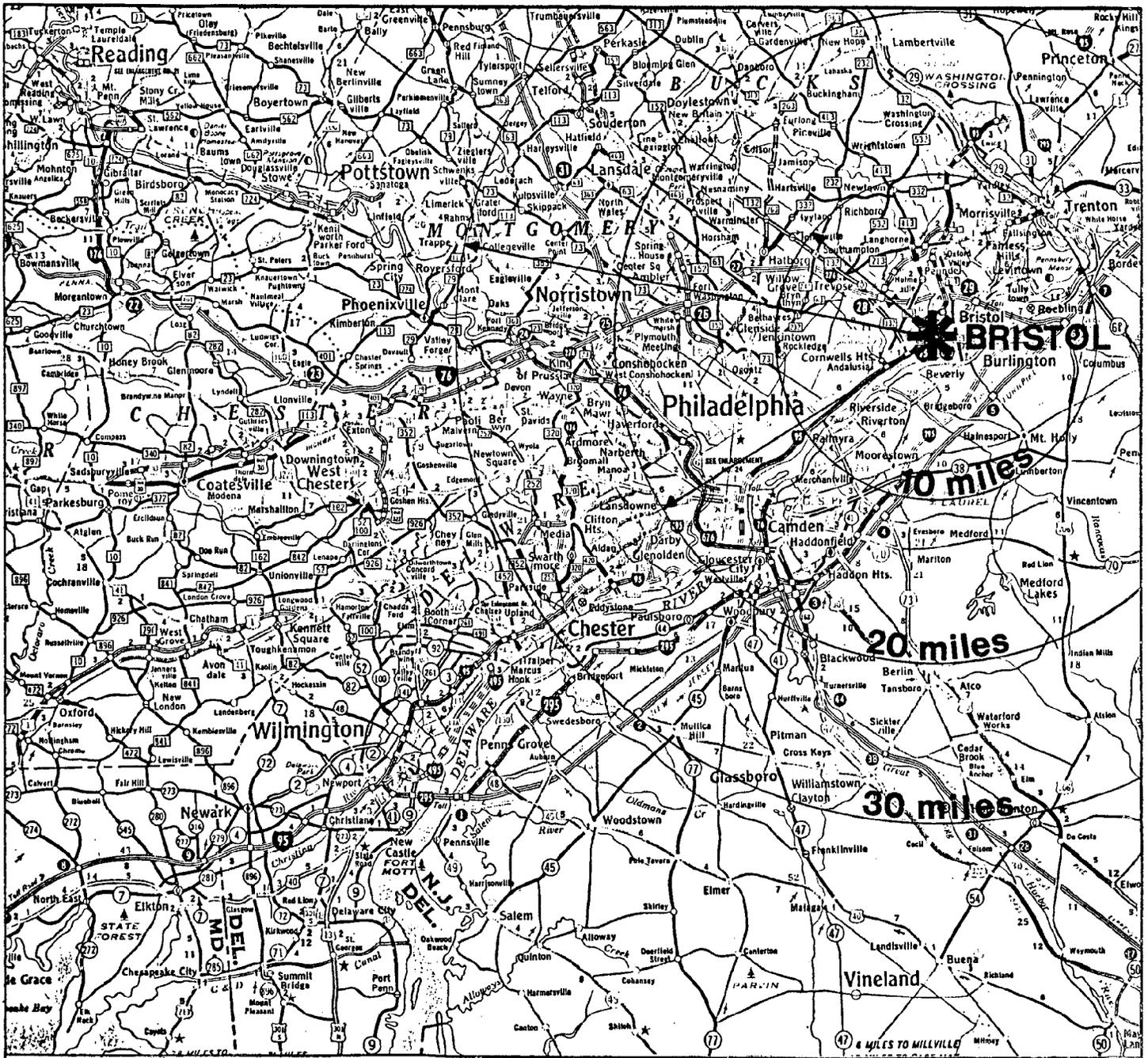
Bristol Borough is one of several communities in Bucks County that has been awarded a grant to conduct a planning study of a proposed project within the Coastal Zone of the Delaware River. These grant funds are Federal funds that have been appropriated by Congress for distribution to Coastal Zone states under the Coastal Zone Management Act of 1972. In the State of Pennsylvania, these funds are administered by the Pennsylvania Department of Environmental Resources.

The Coastal Zone Management Act states, as a general goal, a National policy to preserve, protect, develop, and where possible, to restore or enhance the resources of the Coastal Zone. The funds appropriated are to be used to develop specific Coastal Zone policies, objectives, and goals within each state, and to conduct planning studies for projects that are consistent with these policies, objectives, and goals.

The planning grant awarded to Bristol Borough is to be used to determine the present feasibility of constructing and operating a public marina and an adjoining recreation area at the confluence of Otter Creek and the Delaware River. This study is consistent with the Commonwealth's goal of improving public access for recreation opportunities within the Coastal Zone.

The proposed project, a marina in Bristol Borough, has been the subject of two (2) prior studies. It is the intent of this report to review these studies, to provide recommendations concerning appropriate designs based upon such studies, to provide current cost estimates, and to make recommendations concerning the funding of this project and its feasibility from a financial standpoint.

This study will begin with a brief introduction to the physical characteristics of the site. It will then proceed to an analysis of prior studies, followed by a market analysis. Design alternatives will then be discussed from the standpoint of physical and financial factors. Finally, the financial feasibility of the various alternatives will be discussed in relationship to the present status of funding sources.



Regional Map

OTTER CREEK MARINA FEASIBILITY STUDY



Bristol Borough, Pennsylvania

Direction Associates, Inc. Consultants. Spring House, Pa.

SITE INVENTORY AND ANALYSIS

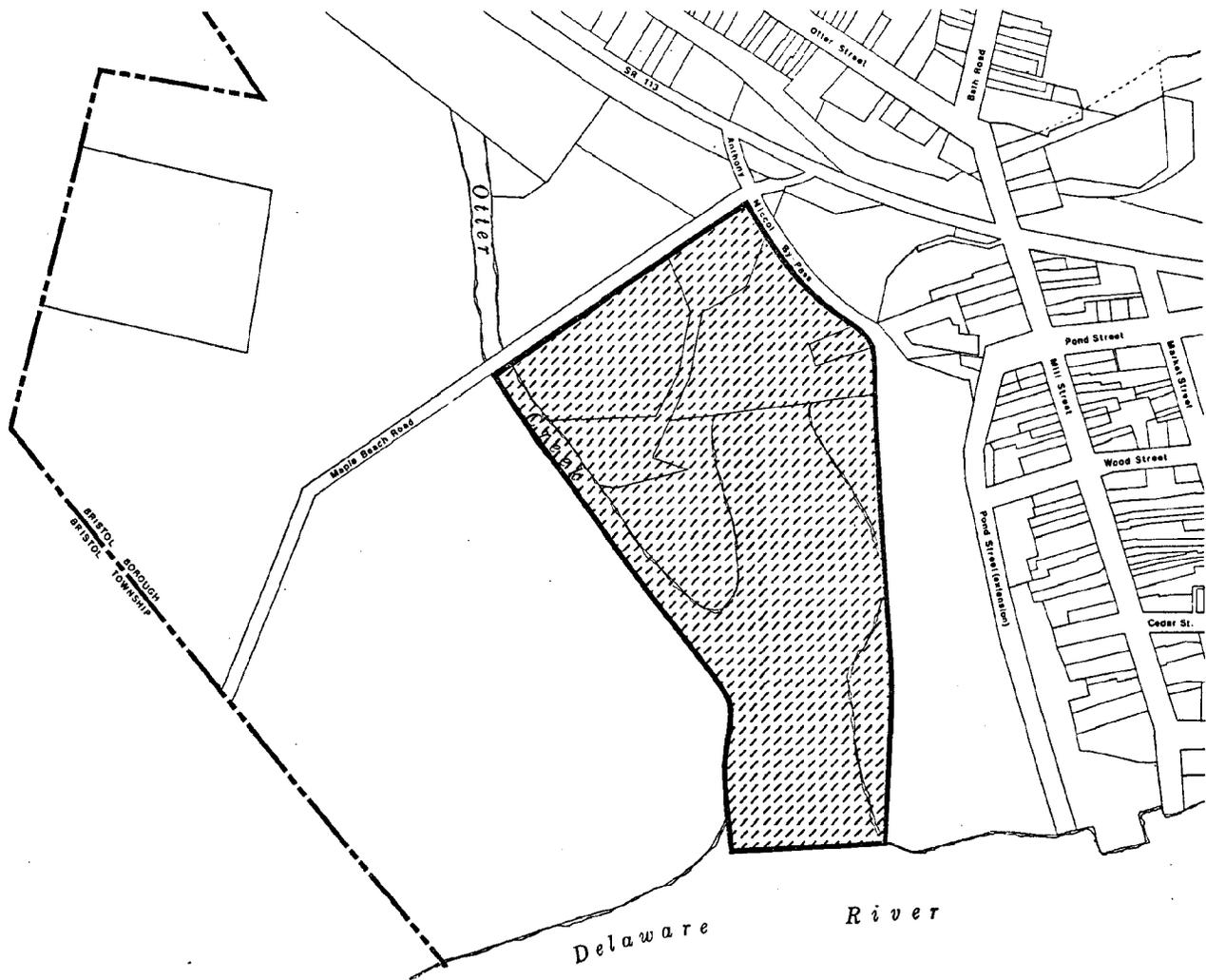
Location:

The site which is the subject of this study is a 20 acre site including a tidal basin (10 acres) and adjoining land area (10 acres) located at the mouth of Otter Creek where it converges with the Delaware River in Bristol Borough, Bucks County, Pennsylvania. Bristol Borough lies in the extreme southern end of Bucks County. It is bounded by the Delaware River on the south and is surrounded by Bristol Township on its inland boundaries. It is approximately 7 miles north of the City of Philadelphia. The City of Burlington, New Jersey, lies across the Delaware River on the opposite shore.

The Borough of Bristol and the subject site have been included in the Delaware Estuary coastal zone because of their location along the Delaware River within the area of the tidal influence of the Atlantic Ocean. The Borough lies within the upper reaches of this tidal influence, which extends upstream to the falls at Trenton, New Jersey.

The Coastal Zone Boundary Map identifies the inland boundary of the Delaware Estuary coastal zone as it has been delineated in Bristol Borough. This boundary is required by the Coastal Zone Management Act, (Section 304(a)), ". . . to extend inland from the shoreline only to the extent necessary to control shorelands, the uses of which have a direct and significant impact on the coastal waters."

The Pennsylvania Coastal Zone Management Program has defined "Geographical Areas of Particular Concern (GAPC)" within the Delaware Estuary coastal zone. There are three (3) basic subcategories of GAPC's: Area of Significant Natural Value; Area of Development Opportunity; and, Area of Significant Recreational, Historical, and Cultural Value. Two (2) of these categories of GAPC's have been identified in Bristol Borough adjoining the proposed marina site, the basin itself has not been defined as a GAPC.



Study Area

**OTTER CREEK MARINA
FEASIBILITY STUDY**

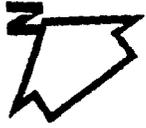


Bristol Borough, Pennsylvania

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OTTER CREEK MARINA FEASIBILITY STUDY



Bristol Borough, Pennsylvania

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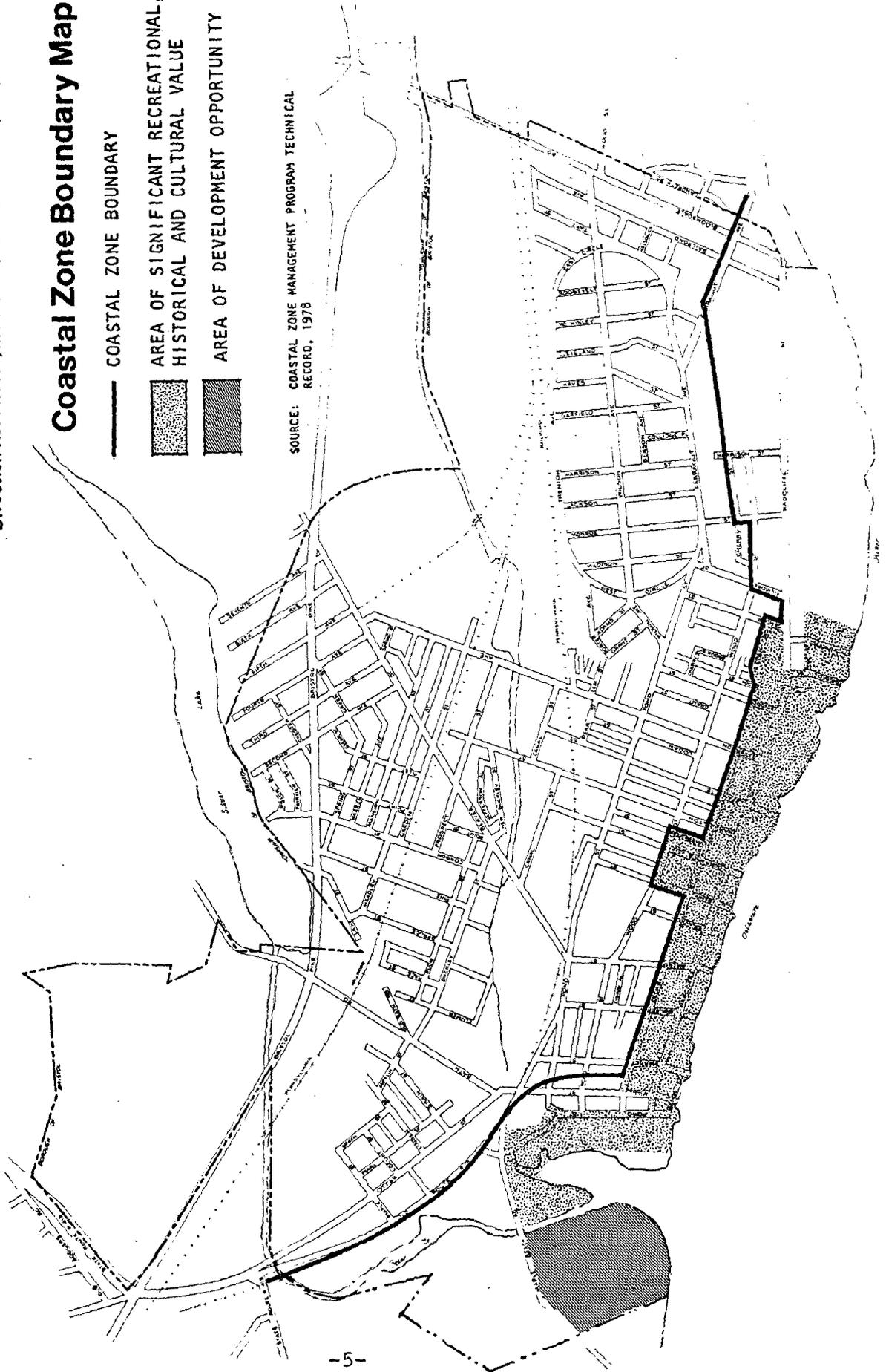
Coastal Zone Boundary Map

— COASTAL ZONE BOUNDARY

▨ AREA OF SIGNIFICANT RECREATIONAL,
HISTORICAL AND CULTURAL VALUE

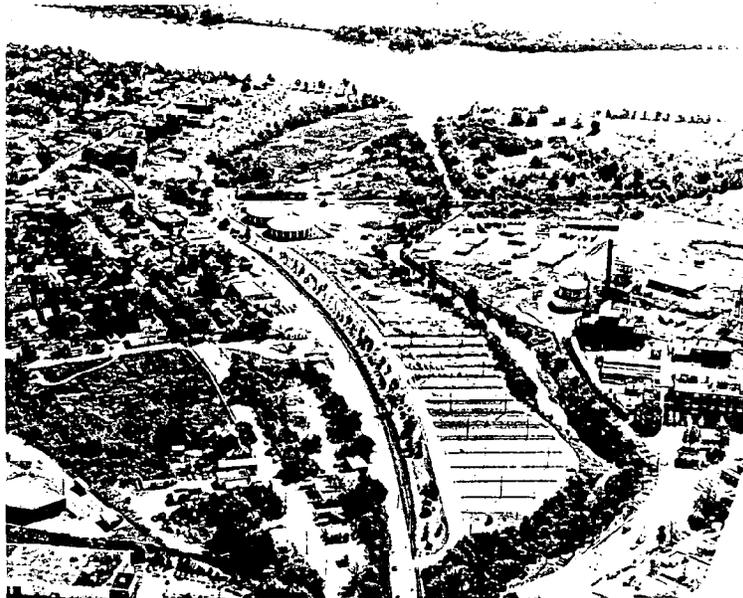
▨ AREA OF DEVELOPMENT OPPORTUNITY

SOURCE: COASTAL ZONE MANAGEMENT PROGRAM TECHNICAL
RECORD, 1978

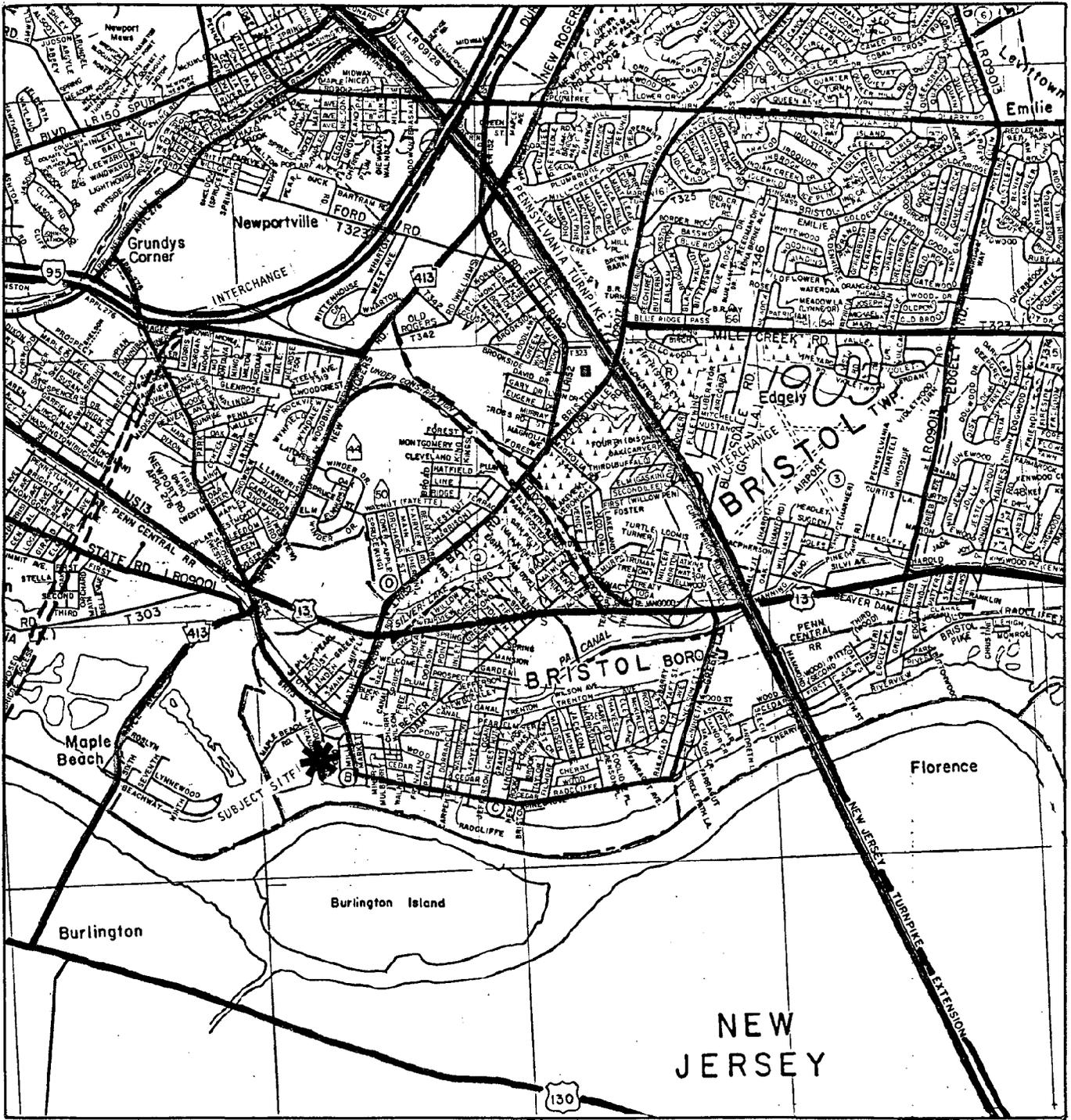


Accessibility:

The subject site is considered to have very good access from the standpoint of both highways and waterways. The Local Highway System Map identifies local and regional highways as they pass through and around Bristol Borough. Immediate access to the site is provided from Old Route 13 (SR 113) via Maple Beach Road and the Anthony Niccol By-Pass. Old Route 13 intersects both Routes 13 and 413 which are important north-south and east-west routes. An interchange for the Pennsylvania Turnpike is located on Route 13 approximately three (3) miles north of the site; an interchange for Route I-95 is located on Route 413 approximately three (3) miles west of the site.



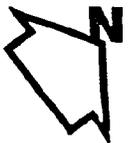
This photo was taken from the vicinity of the intersection of Routes 13 and 413 looking east towards the subject site. The basin is visible in the upper central portion of the photo. Old Route 13 is visible in the center of the photo as it travels towards the site and its intersections with Maple Beach Road and the Anthony Niccol By-Pass.



Local Highway System

**OTTER CREEK MARINA
FEASIBILITY STUDY**

0 1/2 MILE 1 MILE



Bristol Borough, Pennsylvania

Direction Associates, Inc. Consultants. Spring House, Pa.



Maple Beach Road borders the site and is the immediate access road to the site. This is a photo of Maple Beach Road from the vicinity of the Borough garage looking north. The driveway on the right enters the Borough garage and yard. Water storage tanks and a brick accessory structure are located on the opposite side of Maple Beach Road.

This is a view of Maple Beach Road looking north as it intersects first with the Anthony Niccol By-Pass (stop sign) and eventually with Old Route 13. Notice that there is a slight grade that must be encountered as vehicles enter or leave via Maple Beach Road.



The subject site is also accessible from Old Route 13 via the Anthony Niccol By-Pass. This photo was taken looking west on the Anthony Niccol By-Pass from the area of the stop sign shown in the above photo. The By-Pass bears to the right. The sign on the left identifies the entrance to the Rohm & Haas parking lot. The fence on the left encloses the Borough's water storage tanks. Note that there is a slight grade which must also be encountered from this point of access.

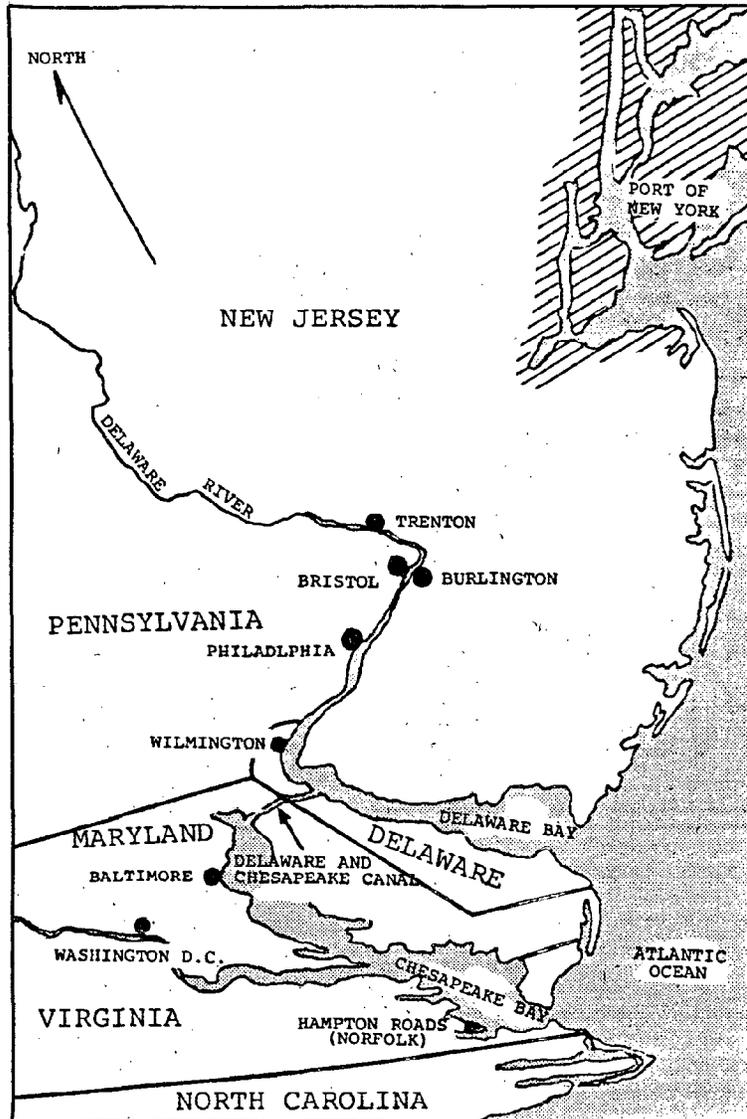
The map, Delaware River Channels and Depth Soundings, identifies the waterway conditions in the immediate vicinity of the proposed marina site. A 40 foot deep navigational channel is maintained in the Delaware River from Philadelphia (Allegheny Avenue) to the Trenton Marine Terminal, a distance of approximately thirty (30) miles. This channel is maintained for the large commercial vessels which serve industries along the Delaware River. The industrial user in this area which generates the most river traffic is the Fairless Works of U.S. Steel.

Smaller recreational craft also use the channel which maintains a width of 400 feet in this area. They may also make use of the more shallow areas on either side of the channel which provide such craft with a navigable area in excess of 700 feet wide between Bristol Borough and Burlington Island, and over 1,200 feet wide at either end of the Island.

The map, Delaware River, and the accompanying Distance Chart, provide a further indication of the opportunity for recreational boating on the Delaware River. Recreational craft may travel 12 miles upstream to Trenton, New Jersey, where the falls prevent further upstream passage. Traveling downstream, the site is approximately 16 miles from Philadelphia, 42 miles from Wilmington, 52 miles from the Delaware and Chesapeake Canal, and 103 miles from the Delaware Bay and the Atlantic Ocean.

Within this area of the Delaware River there are no major obstructions that limit the navigation of recreational craft. All bridges spanning the river are of sufficient vertical clearance and the river channel is of adequate depth to permit passage of the largest recreational craft. ²

²Detailed Project Report, Bristol Marina, Delaware River, Bucks County, Pennsylvania. Department of the Army, Philadelphia District, Corps of Engineers, p. 6.



DISTANCE CHART
BURLINGTON, N.J. / BRISTOL, PA.

	Destination	Nautical Miles
NORTH	Trenton	12
	U.S. Steel Basin	7
SOUTH	Philadelphia	16
	Wilmington	42
	Delaware & Chesapeake Canal	52
	Delaware Bay	103

Source: Boating Almanac, Vol. 3, 1981.

Delaware River

OTTER CREEK MARINA FEASIBILITY STUDY

Bristol Borough, Pennsylvania

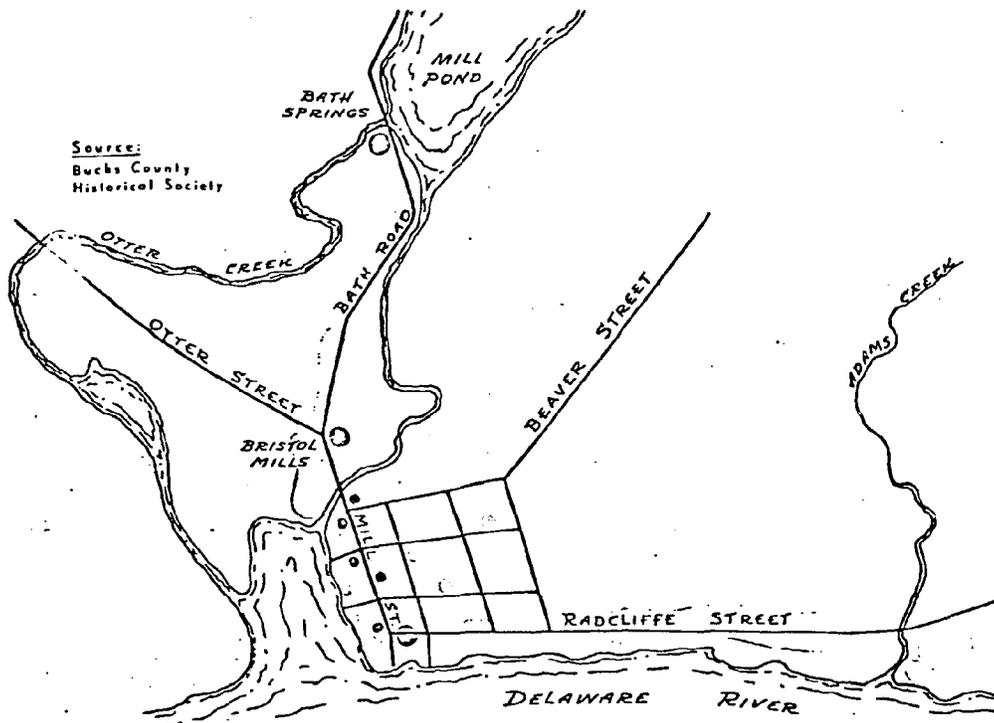
Site Development - Historical Perspective:

The Borough of Bristol was founded in 1681 by Samuel Clift under a grant from William Penn. It is the oldest community in Bucks County. Included in the grant was a stipulation that Clift maintain a ferry and an inn. The ferry service between Bristol and Burlington, New Jersey, began in 1681 at a boat landing at the end of what is now Mill Street. This landing eventually became the Bristol Wharf.

The inn promised in the grant was also opened in 1681. The inn was constructed at the end of Mill Street near the boat landing. It was first known as the Ferry House. In later years, it was renamed the King George II Inn. The Inn is still operating today.

The Borough's early development was due in part to its relationship to two (2) major transportation corridors, the Delaware River and the Kings Highway, which connected Philadelphia with Bristol and Trenton, New Jersey. The Kings Highway passed over Otter Street, Mill Street, and Radcliffe Street in Bristol.

Bristol Borough



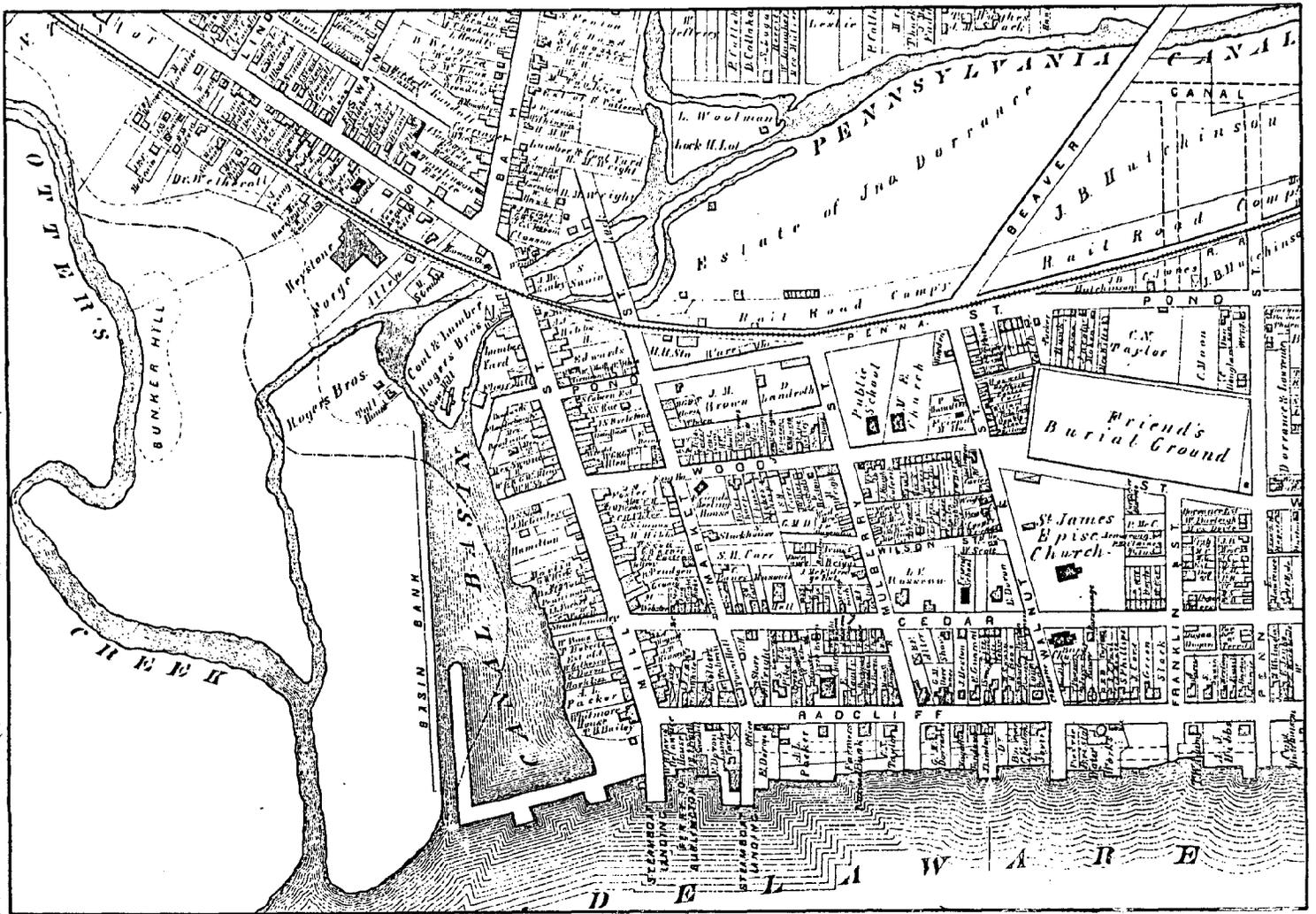


This is the view from Mill Street of the historic Bristol Wharf. Mill Street, the Borough's principal commercial district, extends over 4 blocks from Old Route 13 to the wharf.

The relationship of the wharf to the business district and the river-front park is shown in this photo taken from the area of the boat ramp. The large building in the left of the picture is the historic King George II Inn.

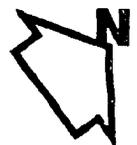


This is a front view of the King II Inn taken from Mill Street. Mill Street continues to the right of the wharf as shown in the photo at the top of this page.



Bristol Borough, 1855

OTTER CREEK MARINA FEASIBILITY STUDY



Bristol Borough, Pennsylvania

In 1830, the Borough found itself at the focal point of a third transportation corridor, the Delaware Canal. The canal extended a distance of 60 miles from Easton to Bristol. Coal, lumber, and grain from the western and northeastern part of the state were carried on the canal to Bristol, making it a major regional marketplace. The canal operated for more than 100 years before closing in 1933.

The map, Bristol Borough, 1855, identifies the location of the canal as it reached its end in Bristol. It is important to note that a canal basin existed in the area now occupied by the municipal parking lot. The basin was eventually filled to allow for the development of the parking lot. The Borough acquired title to the canal basin in 1947. The transfer of ownership from the State of Pennsylvania included a stipulation that the Borough maintain this land as a "parking lot and park" (see Exhibit I).

In addition to the filling of the canal basin, much of the canal bed in Bristol has been filled. In fact, Bristol's Warren Snyder Elementary School was constructed over a portion of the abandoned canal. The photo presented below shows the abandoned canal bed as it exists today near the proposed marina.



This photo was taken near the Anthony Niccol By-Pass looking north to the intersection of Mill Street and Old Route 13. The former canal bed runs under the bridge in the center of the photo.

Despite this failure to maintain the canal bed, the entire length of the canal, from Easton to Bristol, has been included in the National Register of Historic Places. Moreover, it has also achieved National Landmark status. As a result, there exists an impetus to recognize the Borough's relationship with the Delaware Canal in the form of future preservation activities.

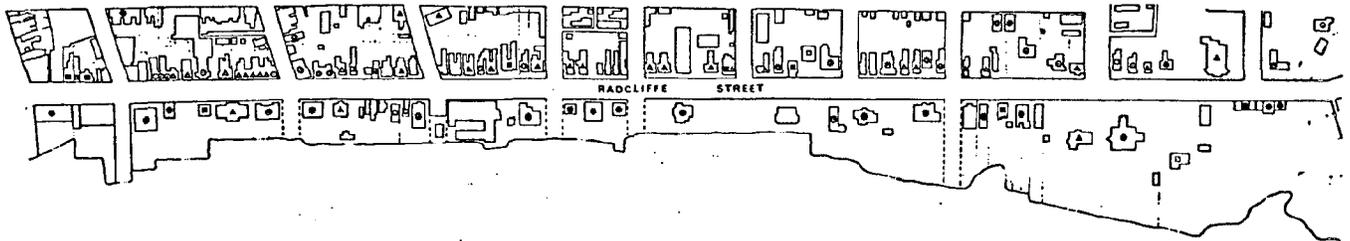
This type of activity has already occurred in another area of the Borough. In 1968, the Pennsylvania Historical and Museum Commission certified an historic zoning district in Bristol, "Historic Radcliffe Street". This designation recognizes the existence of a concentration of buildings on Radcliffe Street of historical and architectural significance. The Survey and Planning Analysis prepared for the Borough of Bristol by the Bucks County Planning Commission described the buildings on Radcliffe Street as ". . . a living museum of American Architecture".

The boundaries of this historic district include generally those properties fronting on Radcliffe Street, extending from Mill Street to the vicinity of Adams Hollow Creek. It also includes all of the waterfront in this area; it does not include the municipal parking lot or the Otter Creek basin which is the subject of this study.

HISTORIC RADCLIFFE STREET

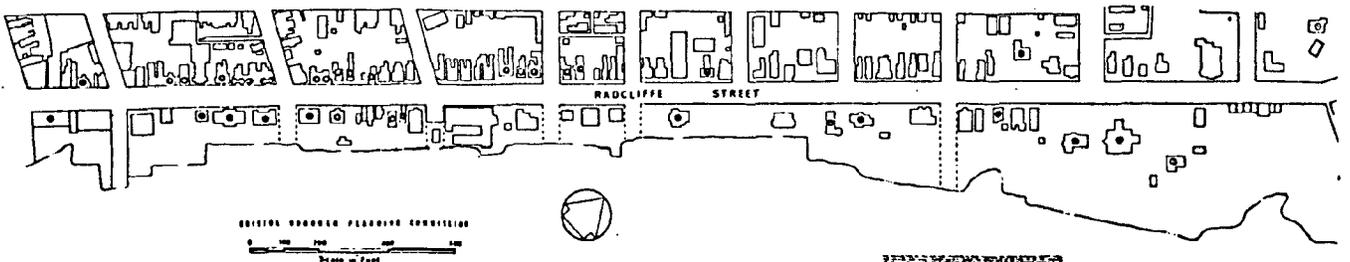
ARCHITECTURAL STYLES

- COLONIAL
- △ CLASSIC REVIVAL
- * VICTORIAN
- FEDERAL
- ▲ GOTHIC REVIVAL
- ◎ ECLECTIC
- CONTEMPORARY



HISTORIC BUILDINGS

SOURCE: Doris Green, A HISTORY OF THE OLD HOMES ON RADCLIFFE STREET, 1934



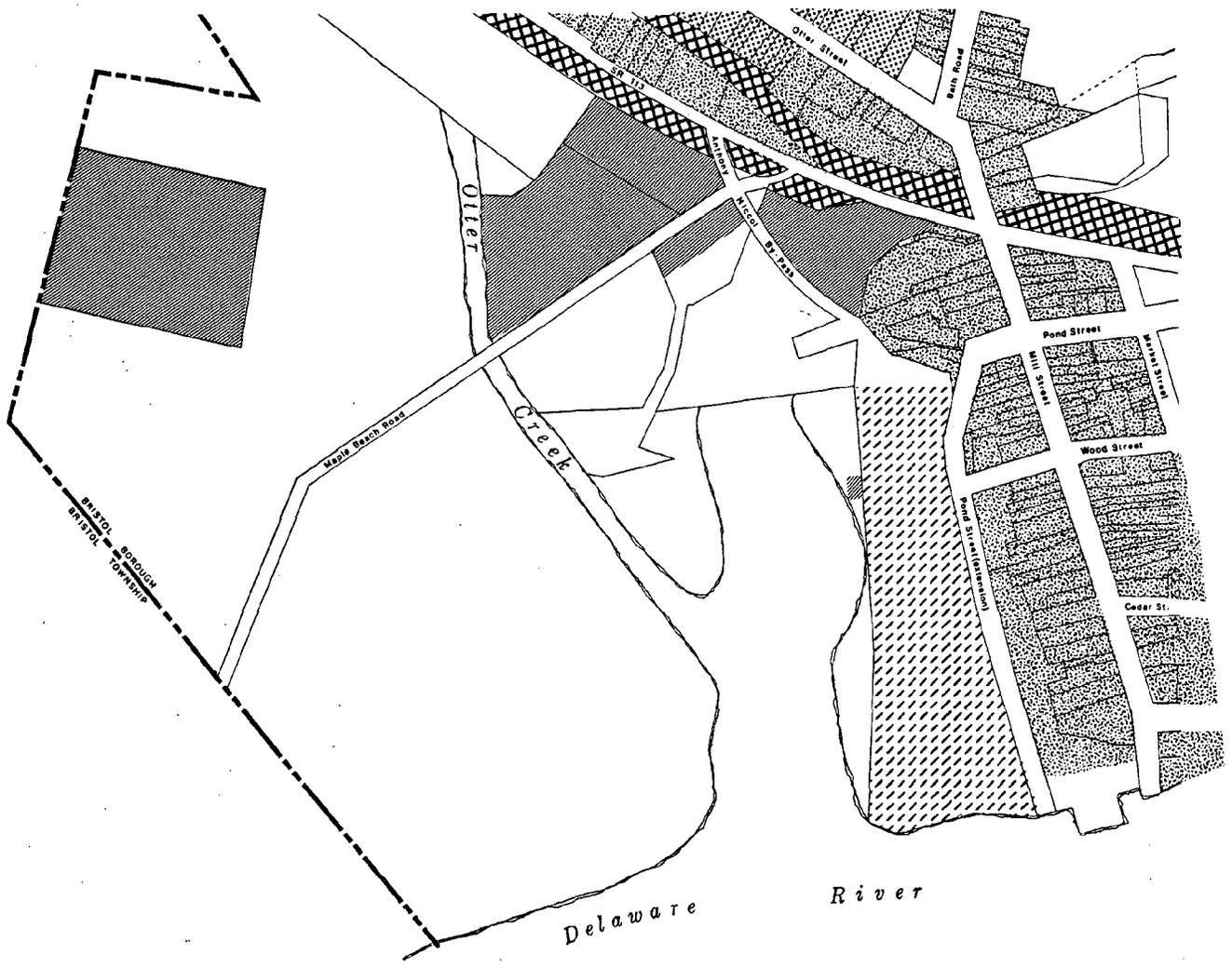
Site Development - Existing:

The existing development in and around the subject site is represented graphically on the Existing Land Use Map. The land area immediately adjoining the basin is generally vacant, undeveloped land. This includes the Maple Beach area to the south, the peninsula separating Otter Creek from the basin, the land area at the head of the basin between the basin and the Borough garage and maintenance yard, and the land area separating the basin from the municipal parking lot (with the exception of a small building housing a water pumping station).

Beyond the immediate area of the site, there is substantial development in all inland directions. To the south and west of the basin, there are major industrial uses including the Borough's sewage treatment plant, and further west in Bristol Township, the large industrial complex of Rohm and Haas, Inc. Due west of the site, on the opposite side of Maple Beach Road, the developed land use is a public utility, the water storage tanks of the Lower Bucks Water and Sewer Authority. These tanks lie between Maple Beach Road and Old Route 13.

Adjoining the water storage tanks and Old Route 13 is the railroad right-of-way occupied by the Bristol Spur Track. This is a freight rail line which carries tank cars to the Rohm and Haas plant. Further west, bordering Old Route 13, the land use pattern includes highway commercial type uses including gas stations and auto repair garages.

The municipal parking lot is located due north of the site and adjoins the Borough's principal retail commercial district. This includes the properties bounding both sides of Mill Street, extending from Old Route 13 to the river.



Existing Land Use

-  RESIDENTIAL
-  COMMERCIAL
-  PUBLIC
-  PARKING
-  RAILROAD RIGHT-OF-WAY
-  VACANT LAND

**OTTER CREEK MARINA
FEASIBILITY STUDY**



Bristol Borough, Pennsylvania

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Aerial View of Subject Site

**OTTER CREEK MARINA
FEASIBILITY STUDY**

0 100 200 300 400



Bristol Borough, Pennsylvania

A better understanding of the nature and extent of the development of these land uses is provided in the photographs presented below and in the following pages. The close proximity of the Borough's business district, the municipal parking lot, a public boat ramp, and a riverfront park area create a favorable atmosphere for the development of a facility such as a public marina. There is, however, the need to recognize the existence of the Borough's garage and yard facility in the analysis of any proposal for development in this area. This may require the demolition of the existing facility and its reconstruction at an alternate location; the conversion of the existing facility to a use such as a boat repair/storage facility and the construction of a new garage and yard at another location, or; the development of on-shore facilities in such a manner as to allow for the continued use and operation of the Borough's garage and yard in its present form and location.



This is a photo taken from Maple Beach Road looking to the east at the Borough's maintenance garage and yard.



The municipal parking lot has excess capacity for additional vehicles. This facility could provide some of the parking that would be needed to serve new development in the Otter Creek basin.



This photo illustrates the relationship of the Mill Street Business District to the municipal parking lot. Only a small number of these buildings house businesses which are oriented toward the parking lot. There exists a significant opportunity to develop new commercial space in the rear of these buildings oriented to the trade generated by potential development in the Otter Creek basin.



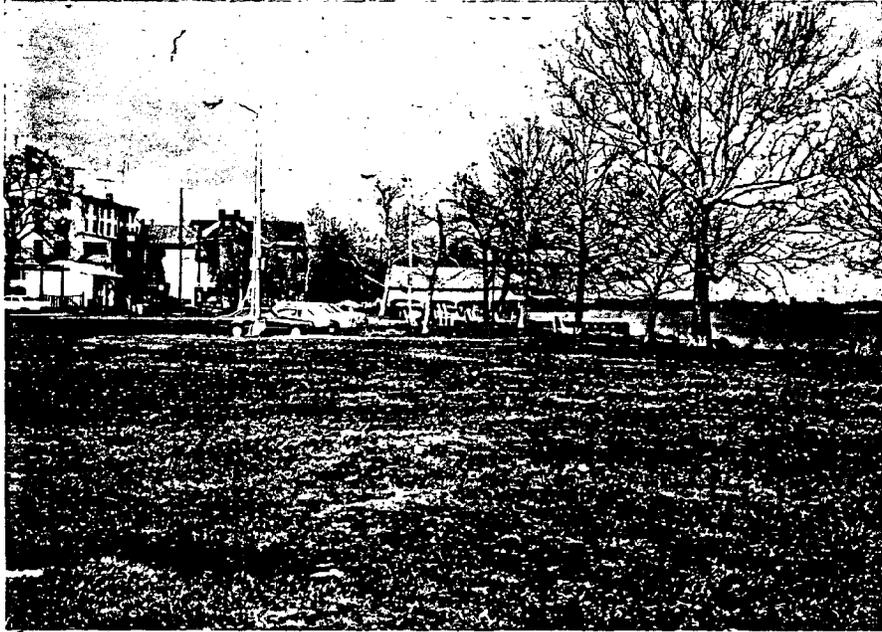
The Borough is fortunate to have a public boat ramp located adjacent to the municipal parking lot. This facility is maintained by the Pennsylvania Fish Commission. Funds have recently been budgeted to improve the ramp and the adjoining park and parking areas.



The boat ramp is adjacent to Bristol's historic wharf. The area between the wharf and the ramp has been improved as a riverfront park with landscaping and benches. Further improvements are planned in conjunction with the rehabilitation of the ramp. Such improvements will be possible through the contributions of a private foundation and the Bristol Lion's Club.

This is a view from the river of the boat ramp, adjoining parking lot, and riverfront park. The parking lot presently provides space for 20 boat trailers. This will be increased to 34 spaces as part of the proposed improvements.





The photo above is a view looking north along the riverfront park area which adjoins the municipal parking lot.

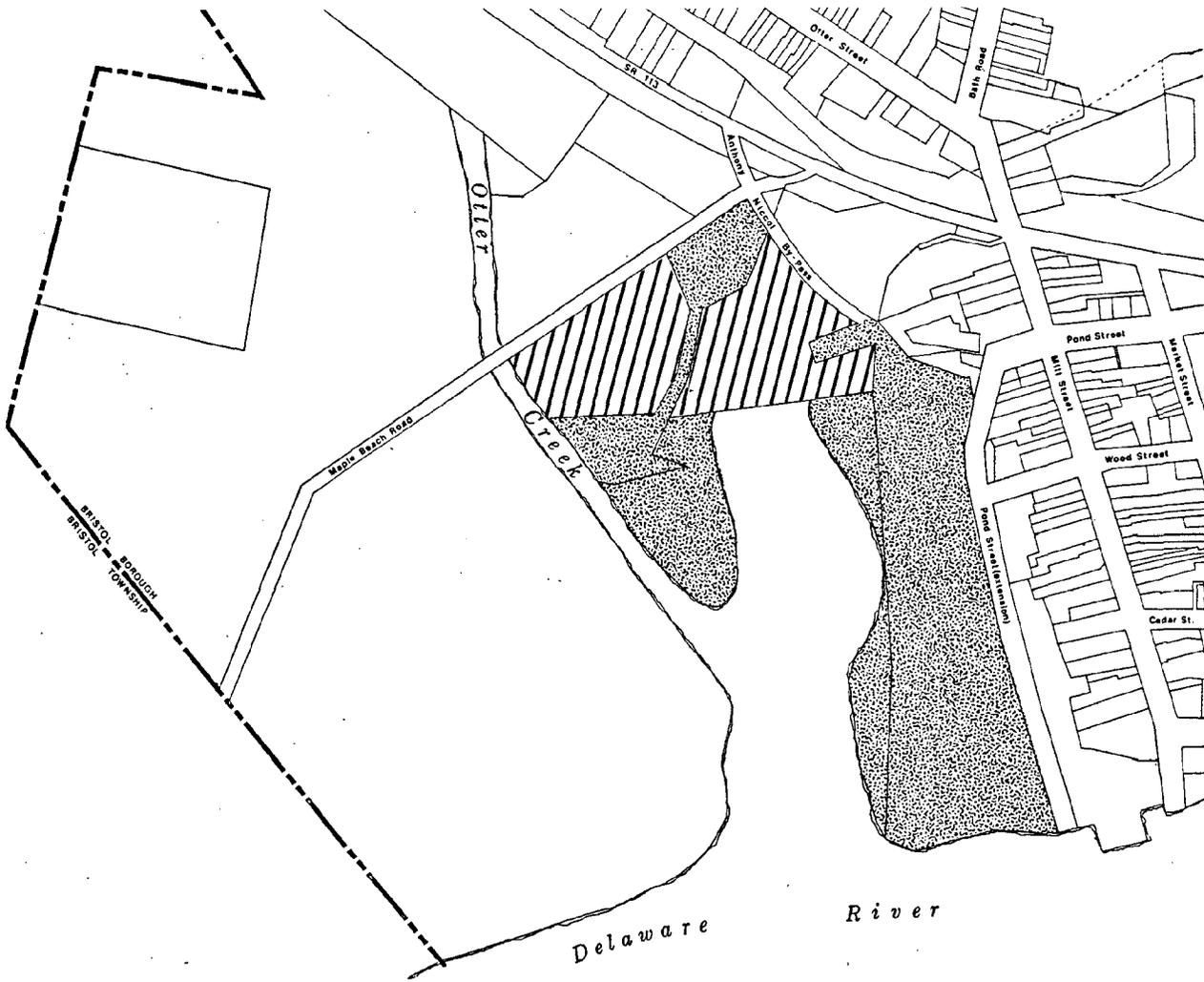


This photo was taken from the same position as the above photo, looking west, however, into the area between the parking lot and the basin.

Ownership:

As stated in a preceding section, the Borough acquired the former canal basin from the Commonwealth to develop as a parking lot with an adjoining riverfront park. As a result, the Borough owns the parking lot, the riverfront park from the Bristol Wharf south to the basin, and the area between the parking lot and the basin's northeastern boundary. However, the Borough does not presently own all of the land bordering the basin.

The map, Property Ownership, identifies land areas along the Anthony Niccol By-Pass and along Maple Beach Road, which do not belong to the Borough. The former is a site of approximately 2.5 acres and is owned by a private individual; the latter is owned by the Grundy Foundation. Both of these sites area presently undeveloped.



Property Ownership



**OTTER CREEK MARINA
FEASIBILITY STUDY**



Bristol Borough, Pennsylvania



Soils, Topography, and Water Areas:

The Soils Map defines the soil types in the land area adjoining the basin. As previously stated, the subject site is a tidal basin. It must be noted that this basin has further been defined as a Tidal Wetlands area.

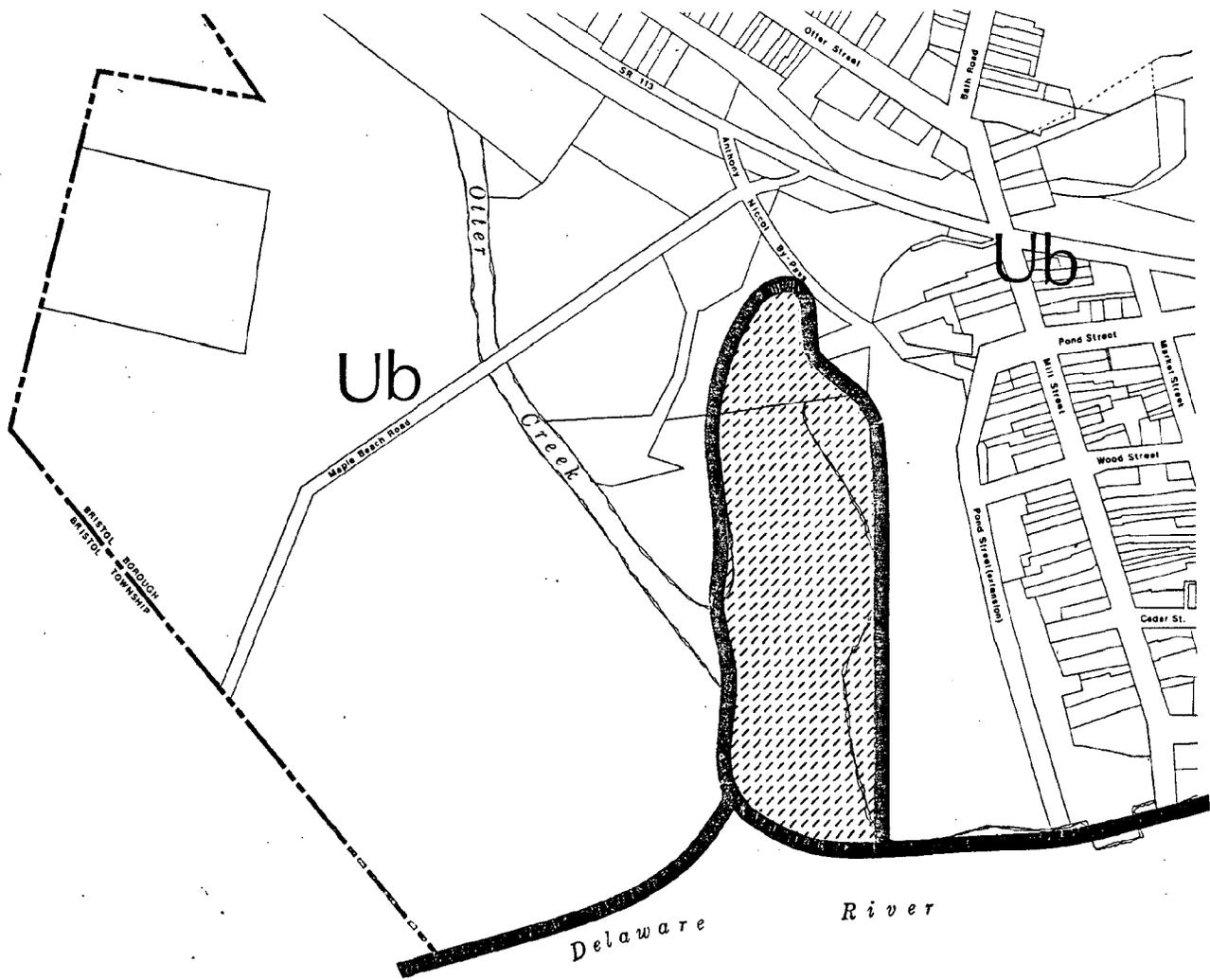
The Urban Land classification is found in virtually all of the land area adjoining the basin. This soil type is assigned to highly built-up areas where the original soil material has been disturbed, filled over, or otherwise disturbed prior to construction.² The capability of the soils in this area must be determined by individual site analysis as the underlying soils are highly variable in the Urban Land series. However, due to the existing development that has occurred in the area, the development potential of this site is not expected to be limited by the soils.

The Tidal Wetlands classification for the basin area presents a different set of problems. The physical limitation of the wetlands is easily overcome, although costly, through the dredging of the site. However, the "wetlands" classification initiates a review process as a result of state and federal laws designed to protect and preserve wetlands areas. Such laws include the River and Harbor Act of 1899; the Federal Water Pollution Control Act of 1972; the Fish and Wildlife Coordination Act; Executive Orders 11990, 11988, and 11514; Research and Sanctuaries Act of 1972; and the Pennsylvania Dam Safety and Encroachments Act.

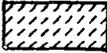


This photo was taken looking almost due east across the basin in the center of the photo. The photo was taken at low tide, illustrating the extent of the wetlands environment.

²Soil Survey of Bucks and Philadelphia Counties, U.S. Department of Agriculture, Soil Conservation Service, July 1975, p. 108.



Soils Map

-  TIDAL WETLANDS
- Ub** URBAN LAND

·SOURCE: LAND RESOURCES MAP, PA. COASTAL ZONE MANAGEMENT PROGRAM TECHNICAL RECORD, 1978
 DELAWARE RIVER ESTUARINE MARSH SURVEY, THE ACADEMY OF NATURAL SCIENCES, 1973.

**OTTER CREEK MARINA
 FEASIBILITY STUDY**

0' 200' 400' 600' 800' 1000'

Bristol Borough, Pennsylvania





This photo was taken from a boat in the Delaware River looking directly into the Otter Creek Basin at high tide. Otter Creek is visible in the left of the photo as it flows from Maple Beach Road to the river. The Borough's maintenance building is partially visible in the left central portion of the photo. The large building visible on the right is a commercial structure located at the corner of Mill Street and Old Route 13. The municipal parking lot is located adjacent to the trees which border the basin on the right. The vegetation in the water on the right is Spatterdock, a type of vegetation common to tidal wetlands and flood plains.



This is a view of the Otter Creek Basin at low tide. This photo was taken from the edge of the riverfront park adjoining the river and the parking lot, looking west, southwest. Otter Creek flows to the Delaware adjacent to the tree-lined shore in the central portion of the photo. The smoke-stack in the right/central portion of the photo is part of the Rohm and Haas facility in Bristol Township. The Borough's water storage tanks are visible in the right of the photo. The tanks would be adjacent to the proposed marina's on-shore facilities.

The recognition of the value of wetlands is a relatively recent occurrence. In fact, none of the prior studies concerning this site have addressed this issue. The following definition of a "wetlands" appears in Executive Order 11990: Protection of Wetlands:

". . . those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal conditions does or would support a prevalence of vegetative or aquatic life that require saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats and natural ponds."

The purpose of Executive Order 11990 is to recognize the "natural and beneficial values of wetlands" and to provide a vehicle for encouraging their preservation by ". . . avoiding the direct or indirect support of new construction in wetlands wherever there is a practicable alternative". The "natural and beneficial values of wetlands" are summarized below:³

- Wetlands serve important natural biological functions, including food chain production, general habitat and nesting, spawning, rearing and resting sites for aquatic or land species.
- Wetlands often shield other areas from wave action, erosion, or storm damage.
- Wetlands often serve as valuable storage areas for storm and flood waters.
- Wetlands are often prime natural recharge areas where surface and ground water are directly interconnected, and
- Wetlands serve to purify water through natural water filtration processes.

The legislation that has been enacted to preserve wetlands areas is the result of the recognition of the substantial loss of wetlands that has occurred in the United States. The U.S. Soil Conservation Service has estimated that the original natural wetlands of this country covered 127 million acres; a recent (1971) inventory of the Nation's wetland areas prepared by the U.S. Fish and Wildlife Service identified an estimated 74.4 million acres remaining with the possibility of an additional 5 to 7 million acres

³ U.S. Army Corps of Engineers' Public Interest Review and Wetlands Policy, 1977.

overlooked in the survey.⁴ The result is an estimated loss of at least 45 million acres of wetland areas.

Although the various laws are designed to protect wetlands, they usually contain a statement that qualifies the extent to which activities which may be harmful to wetlands will be prohibited. Such language normally requires a demonstration that the "public benefits of a proposed project outweigh the damage to the wetlands resource and that the project is necessary to realize the public benefits".⁵

There are several factors relating to the proposed development of a marina at the subject site which suggest that such a project would meet the "public benefit" criteria. First, it should be stated that marinas are generally considered to be among ". . . the most legitimate construction in wetlands simply because docking facilities can be located only on shorefront".⁶ Further, the size and extent of this wetlands is not "significant". The Pennsylvania Coastal Zone Management Program, Technical Record provides support for this position. While the Program includes policy statements in support of the preservation of wetlands, it has only identified ". . . the most significant wetland areas . . ." within its Geographic Areas of Particular Concern (GAPC). As previously indicated in the Coastal Zone Boundary Map, the subject site is not identified as a GAPC.

A further statement of the position of the Technical Record on the possible development of the subject site can be implied from the information presented in Chapter 7, Permissible Land and Water Use. Figure VII-6, Compatibility and Suitability of Coastal Resources to Support Uses, provides an impact matrix in which we can determine the position established for the undertaking of "developed waterfront recreation" in "wetlands".⁷ The term "developed waterfront recreation" is defined as "marinas and boat launching facilities for water related activities and park land along the shoreline". The matrix states that such uses fall within the "0₂" impact category, which means that "the use has potential major benefit to water-based recreation or to the preservation of shoreline natural areas".

⁴"Wetlands of the U.S.", U.S. Department of the Interior, Fish and Wildlife Service, Circular 39, 1971, p. 7.

⁵Title 25, Part I, Pennsylvania Department of Environmental Resources, Subpart C, Protection of Natural Resources, Article II, Water Resources, Chapter 105, Dam and Waterway Management, Section 105.18 Projects Affecting Wetlands, Subsection (a).

⁶"Our Nation's Wetlands", An Interagency Task Force Report", Superintendent of Documents, Washington, D.C., 1978, pp.43-44.

⁷Pennsylvania Coastal Zone Management Program, Technical Record, p. 5-15.

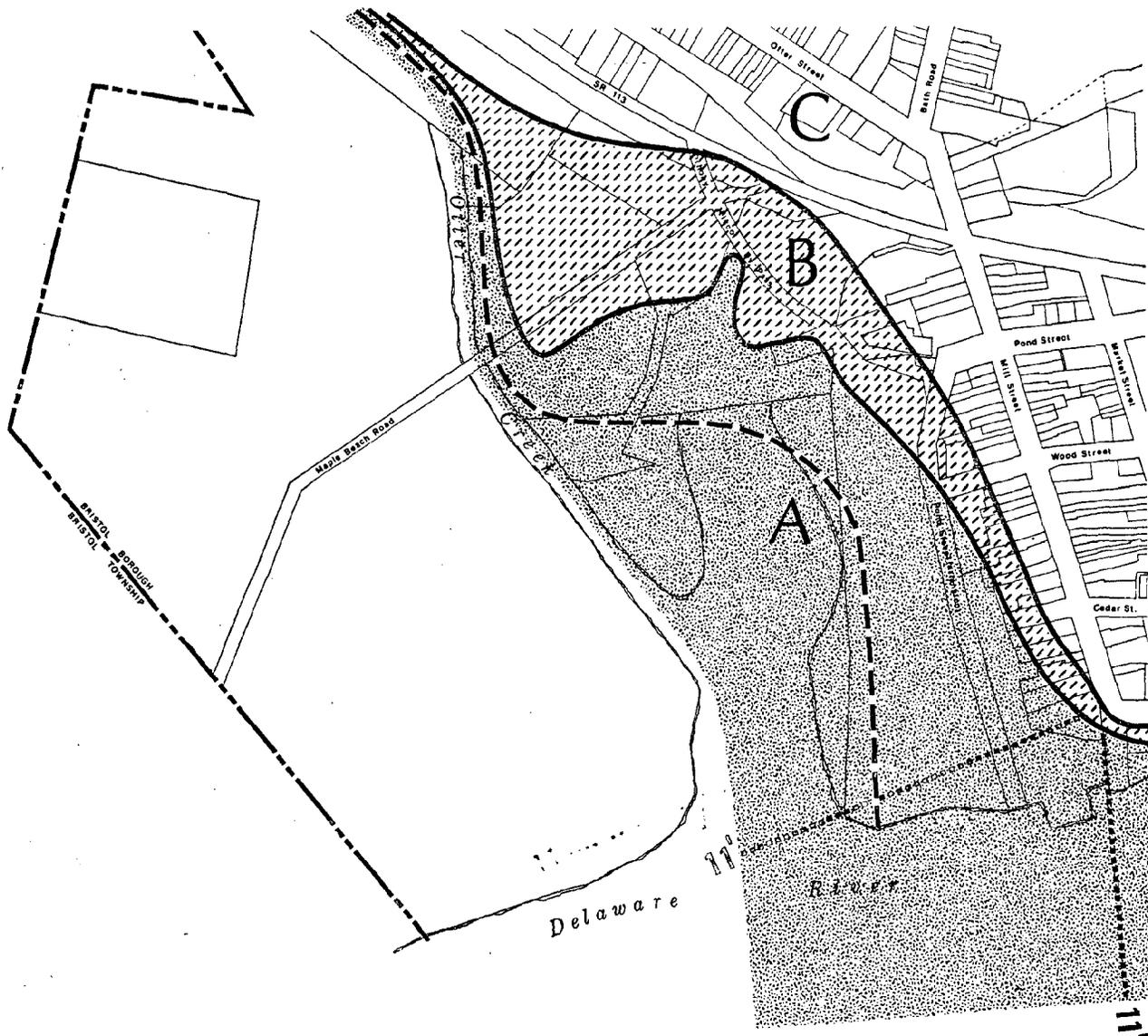
Despite the apparent ability to overcome the limitations of wetlands legislation, the existence of a wetlands environment suggests that there are other potential limiting conditions. In this case, the limiting condition relates to the flood plain status of the site. The Flood Boundary Map identifies the area of the "100 year flood" and the "floodway". The "floodway" is the area of the flood plain which is most prone to flooding and which is designated as an area to be reserved to carry the flow of the 100 year flood. Almost the entire basin and the peninsula separating the basin from Otter Creek fall within the "floodway". Most of the on-shore areas adjoining the basin fall within the balance of the 100 year flood plain. This area is generally referred to as the "floodway fringe" area. Only the areas immediately adjoining Maple Beach Road and the Anthony Niccol By-Pass fall outside of the 100 year flood plain.

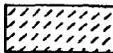
The Federal Insurance Administration of the Department of Housing and Urban Development has established standards for regulating development within the 100 year flood plain. The Borough has adopted such standards as amendments to its Zoning Ordinance, Subdivision and Land Development Ordinance, and Building Code. The amendments to the Zoning Ordinance specifically limit the uses permitted in the "Floodway" and the "Floodway Fringe", these are the two "overlay" districts of the 100 year flood plain.

A review of the provisions of this ordinance indicate that a marina is a "conditional use" within the Floodway district. A conditional use is a use which is permitted only upon review by Borough Council. However, the ability to construct a "marina", in the Floodway District, is limited to the water-borne development of piers, slips, bulkheading, etc. No on-shore facilities can be constructed unless it can be shown that the "effect of such development on flood heights is fully offset by accompanying improvements". While such "improvements" may be satisfied by the dredging of the basin, it is safe to assume that on-shore facilities should not be constructed in the peninsula separating the basin from Otter Creek, as this is the principal land area which falls within the Floodway District.

On-shore facilities may be developed in the Floodway Fringe District under less restrictive conditions. Uses permitted by the underlying zoning district are permitted, provided all new construction meets the flood-proofing standards of the Building Code amendments. The basic rule for new construction in the flood plain is presented below:

". . . the lowest floor including basement of any new or improved non-residential structure shall be at least one and one-half (1½) feet above the one hundred (100) year flood elevation or be designed and constructed so that the space enclosed by the structure shall remain either completely or essentially dry during any flood up to that height."



-  OTTER CREEK FLOODWAY
-  100 YEAR FLOOD PLAIN
-  500 YEAR FLOOD PLAIN
-  BASE FLOOD ELEVATION IN FEET

Flood Boundary Map

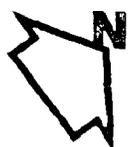
SOURCE: FLOOD BOUNDARY AND FLOODWAY MAP AND FLOOD INSURANCE RATE MAP - COMMUNITY - PANEL NO. 20183-00018
 U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
 DECEMBER 18, 1979.

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.
C	Areas of minimal flooding.

OTTER CREEK MARINA FEASIBILITY STUDY



Bristol Borough, Pennsylvania



The final effect of these various regulations is to limit the development of on-shore facilities serving the marina. These limitations also extend to the "storage of bouyant materials and equipment" which would appear to regulate the dry storage of boats in the winter. The Zoning Ordinance prohibits the storage of "bouyant materials and equipment" unless ". . . such material or equipment is firmly anchored to prevent flotation or movement, and/or can be readily removed from the area within the time available after flood warning".

The reference to the elevation of the 100 year flood requires a knowledge of the site elevations to determine its full effect. A topographic map of the basin and adjoining land areas has been prepared by Middle Atlantic States Engineers, Inc. to assist us in this analysis and to determine the amount of dredging required to construct a marina. The elevations presented on the map, Topography, are based upon mean low water elevations.

The wetlands area previously described is identified in the Topography map by the area which would be below water at high tide. The mean tide range in this area is 6.45 feet.⁸ This would include any areas in the map which would fall between 0 (mean low water) and 6.45 feet.

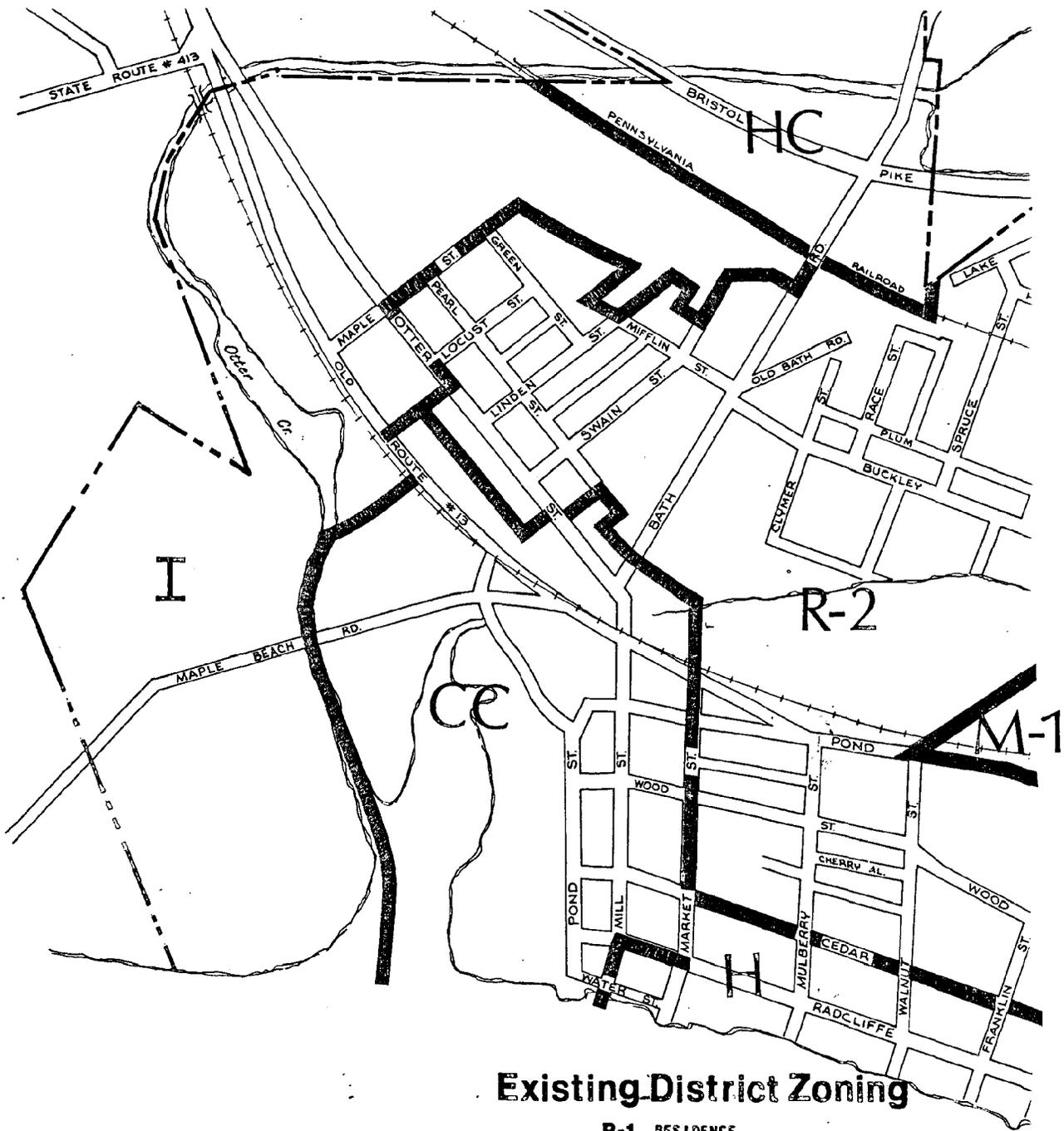
⁸Detailed Project Report, Small Navigation Project, Bristol Marina, Delaware River, Bucks County, Pennsylvania, Department of Army Corps of Engineers, 1976, p. 4.

Zoning:

Another potential regulatory limitation on the development of the site results from its zoning designation. The Existing Zoning District Map indicates that the basin and adjoining land areas are zoned CC, Central Commercial. The Zoning Ordinance provides that the following uses are permitted in the Central Commercial District under the general category of "Utilities, Communications and Transportation".

- (49) Marina, including commercial and recreational uses customarily incidental to a marina.

This provision acknowledges the proposals presented in the Borough's Comprehensive Plan (1966) which proposes the development of a marina and necessary on-shore facilities for the subject site.



Existing District Zoning

- R-1 RESIDENCE
- R-2 RESIDENCE
- H HISTORICAL
- CC CENTRAL COMMERCIAL
- HC HIGHWAY COMMERCIAL
- I INDUSTRIAL
- M-1 MODIFIED INDUSTRIAL

**OTTER CREEK MARINA
FEASIBILITY STUDY**



Bristol Borough, Pennsylvania

PROJECT HISTORY

In 1962, the Bristol Borough Council authorized the incorporation of a seven (7) member Marina Authority (Exhibit II). This Authority was assigned the responsibility of exploring the financial feasibility of constructing a marina at the mouth of Otter Creek. To assist the Authority in this effort, the firm of C.A. Chaney and Associates was employed to prepare a financial feasibility study.

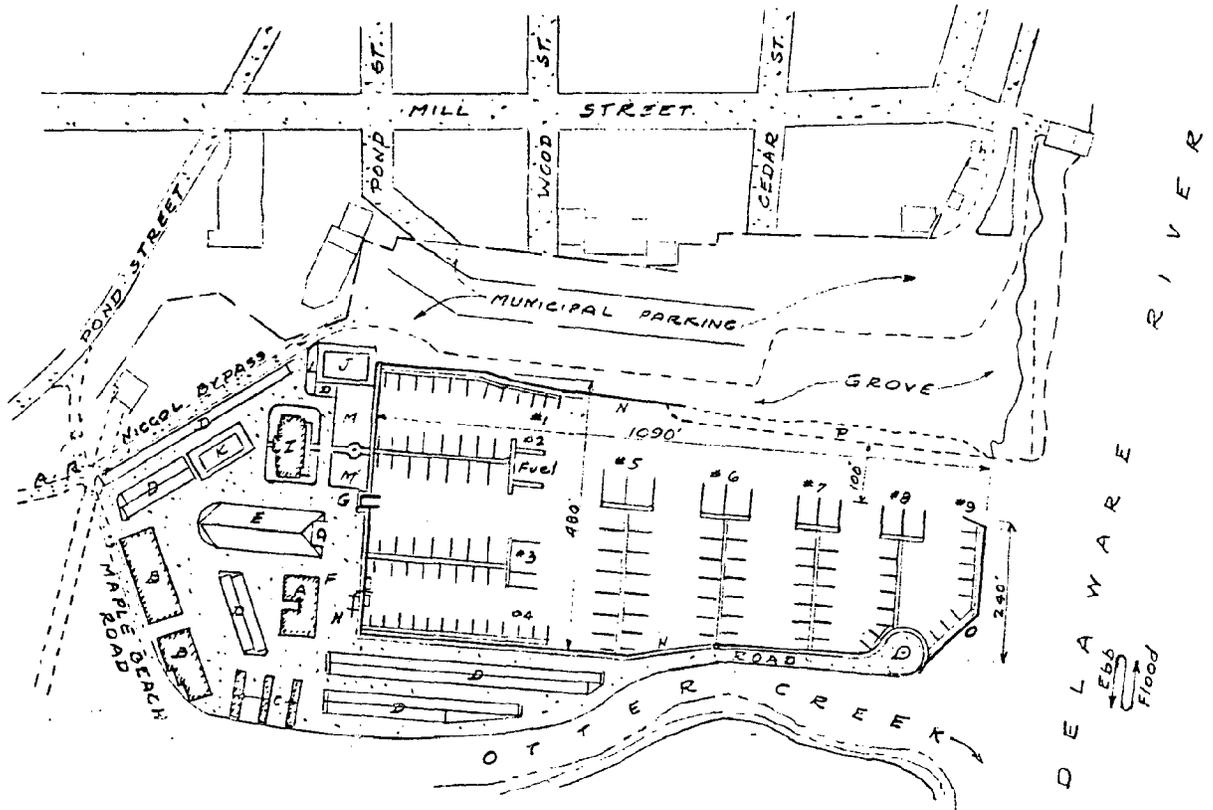
The results of this study are summarized in the illustration, Scheme 1, and the accompanying Table 1, On-Shore and Off-Shore Activities - Financial Summary. This proposal concluded that the construction of a marina at this site was physically and financially feasible.

The proposed development was a 246 slip marina with substantial on-shore facilities. These facilities included public recreation facilities (swimming pool, tennis courts, etc.), and boating service facilities deemed as mandatory for the financial viability of the project. The financial structure of the project was based upon the findings of nation-wide surveys that indicated that most of the income of marinas is derived from on-shore facilities.⁹

The total cost of constructing the marina and the on-shore public recreation and boating service facilities was estimated at \$1,217,100. The annual operating costs, including overhead, were estimated at \$990,593. It was projected that in the second year of operation this facility would provide an annual income of \$1,204,884, leaving a net profit of \$153,436 after the annual retirement on investment. This analysis assumed that the income from the rental of boat slips would provide only \$51,696 of the total annual income; the balance of the income was produced by the various on-shore facilities.

The Marina Authority received this report in September, 1963. After careful consideration, including discussions with private investors, it was determined that it would not be possible for the Borough to undertake this project without pledging its taxing power. The project did not proceed further because of the Borough's then difficult financial condition.

⁹ Financial Feasibility Study, Proposed Otter Creek Marina, C.A. Chaney & Associates, 1963, p. 22.

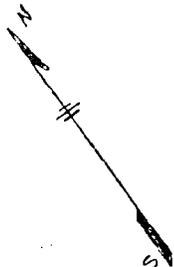


LEGEND

- A - Sales and Service Building.
- B - Storage Sheds - Large Boats.
- C - Storage Sheds - Small Boats.
- D - Parking - Automobiles.
- E - Parking - Autos. & Boat Trailers.
- F - Service Area.
- G - 20-Ton Travelift Hoist or equal.
- H - 1 1/2 Ton Monorail Boat Hoist.
- I - Social Activities Building.
- J - Swimming Pool.
- K - Tennis Court.
- L - Shuffle Board.
- M - Lawn
- N - Bulkhead Wall
- O - Breakwater
- P - Slope

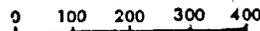
CAPACITY.

- Slips - 246 Boats.
- Parking - 271 Automobiles.
- Parking - 24 Autos with Trailers.
- Storage - 72 Small Boats in Sheds
- Storage - 15,400 Sq.Ft. in Sheds for Large Boats.



John E. Scheme 1

**OTTER CREEK MARINA
FEASIBILITY STUDY**



PRELIMINARY PLAN.
SCHEME NO. 1.
PROPOSED OTTER CREEK MARINA.
for
BOROUGH OF BRISTOL - PENNA.

CACHANEY & ASSOCIATES
WASHINGTON, D.C.

9 Sept. 1963. DNG-509-P-1

Bristol Borough, Pennsylvania -38-

Direction Associates, Inc.....Consultants.....Spring House, Pa.

TABLE I

Financial Feasibility Study, Proposed Otter Creek Marina, C.A.Chaney Associates, 1963

ON-SHORE AND OFF-SHORE ACTIVITIES - FINANCIAL SUMMARY

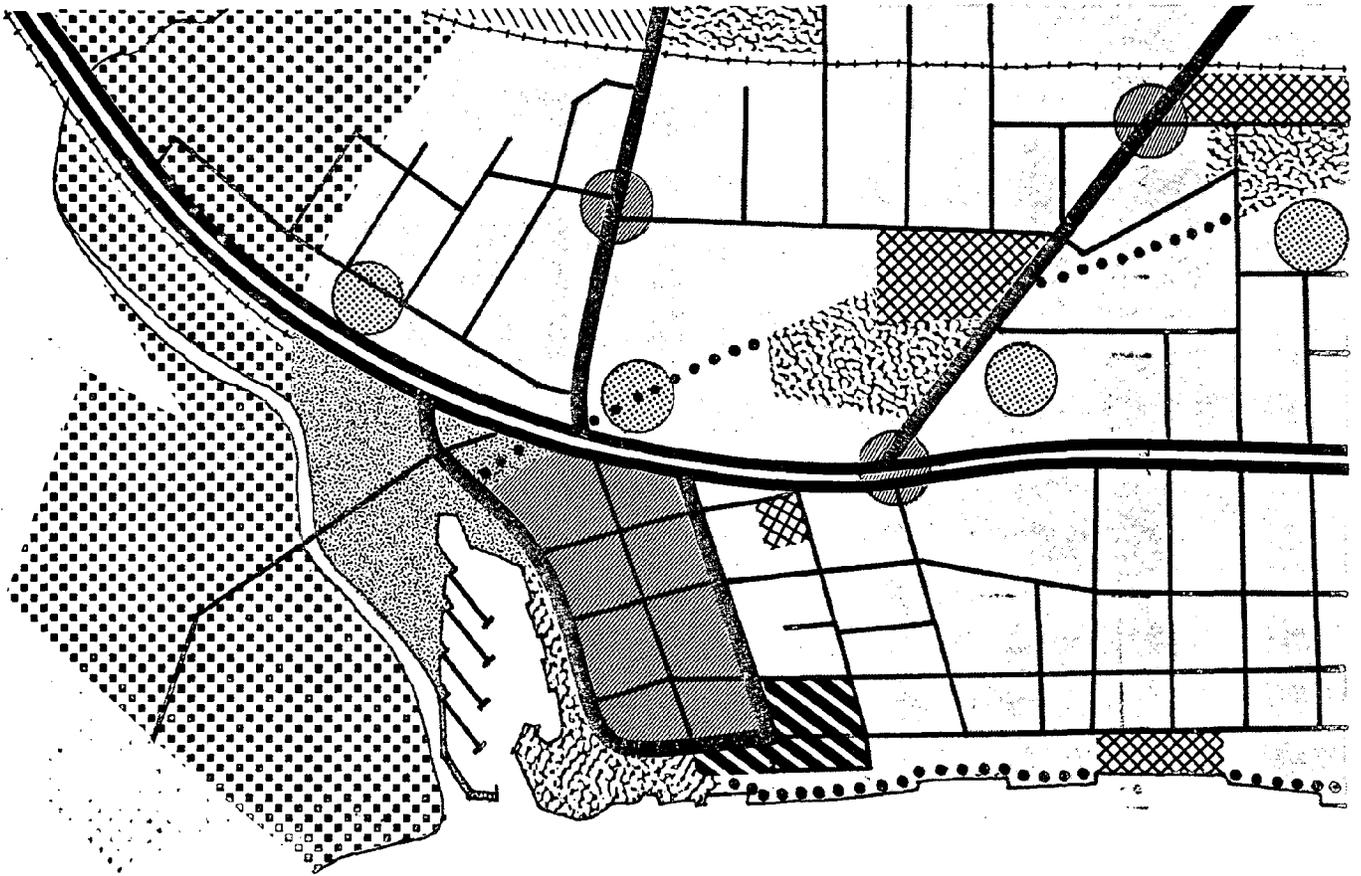
NO.	CLASSIFICATION	CONSTRUCTION COST	OPERATING EQUIPMENT, MATERIAL, & SUPPLIES	LABOR SPECIFICALLY ASSIGNED	DEPRECIATION RATE %	ANNUAL AMT.	MAINTENANCE		OVERHEAD	TOTAL COSTS	ANNUAL INCOME	PROFIT BEFORE TAXES
							LABOR	MATERIAL				
1	Bullhead Wall	\$ 180,000	\$ --	\$ --	4	\$ 7,200	\$ 300	\$ 150	\$ 8,079	\$ 15,729	--	(-) \$15,729
2	Ramps, at Walks	4,800	--	--	6	288	50	25	--	--	--	--
3	Main Walks	235,450	200	5,000	6	14,127	1,000	2,500	12,532	35,359	\$ 51,336	\$0,904
4	Slips - Open - Annual										6,750	
5	Slips - Covered - Annual											
6	Slips - Transient											
7	Boat Storage - Large - Open	4,200	300	4,000	6	252	100	50	4,706	14,738	18,120	13,156
8	Boat Storage - Large - In Sheds	69,300	200	4,000	5	3,465	150	50	--	--	8,170	--
9	Boat Storage - Small - In Sheds	16,300	200	4,500	3	813	400	50	--	--	26,265	--
10	Travelift Hoist - for Storage	17,700	100	4,500	8	1,816	160	75	1,695	11,872	7,030	--
11	Repairs - Boats on Trailers			3,000	6	576	200	50	--	--	8,008	--
12	Repairs - Boats in Sheds			3,000	6	576	200	50	--	--	8,740	--
13	Repairs - for Show										1,250	--
14	Inboard Engines		18,000	50,000	4	1,200	300	500	8,274	78,274	122,770	44,496
15	Outboard Engines			50,000	4	480	750	500	35,034	381,014	35,000	37,986
16	Outboard Motor Storage			22,000	4	480	750	500	--	--	384,000	--
17	Repairs - Brokers	55,800	500	15,750	4	480	750	500	--	--	286,000	52,657
18	Boats - New & Used		306,000	22,000								
19	Inboard Engines			20,000	4	400	900	500	21,543	233,343	286,000	--
20	Outboard Engines			20,000	4	400	900	500	--	--	36,000	--
21	PAIR & ACCESSORIES										57,060	19,877
22	Exit			9,000	6	152	250	750	2,670	27,822	6,500	--
23	Package Food			3,500	10	420	200	100	4,241	51,861	13,500	8,931
24	Sneak Bar - (25 Seats)	4,200	2,000	100	10	420	200	100	--	--	3,000	--
25	Drain Oil		2,000	500	10	200	100	100	--	--	1,350	--
26	Lubricating Oil		1,500	2,500	10	150	100	100	--	--	650	--
27	Ice		200	1,000	10	350	75	50	599	6,599	13,500	--
28	Boat Washing and Icing		3,500	1,000	10	75	200	150	--	--	3,000	--
29	Storm Damage Service		--	1,000	--	--	--	--	--	--	1,350	--
30	Silge Pumping		100	1,000	--	--	--	--	--	--	800	--
31	Locker Rental - Emergency Only	3,000	--	150	10	300	150	150	320	2,970	3,000	--
32	Trailer Rental - Emergency Only	--	1,000	100	20	200	100	100	--	--	1,350	--
33	Boat Charter Service	--	100	300	--	--	--	--	--	--	800	--
34	Forklift Truck	9,000	500	600	10	900	130	75	1,720	8,239	--	(-) 7,439
35	Truck and Auto	8,500	1,250	300	12	1,020	125	140	--	--	--	--
36	Machine Tools	9,300	--	--	8	744	160	140	--	--	--	--
37	Office Equipment	4,000	--	--	10	400	75	25	--	--	--	--
38	Social Activities Building		27,000	26,000	4	4,496	420	1,360	12,385	87,471	105,000	19,479
39	Restaurant (100 Seats)	211,400	5,100	6,300	4	4,496	243	315	--	--	1,350	--
40	Club Section		1,600	200	10	150	35	40	--	--	1,250	--
41	Lockers	1,000	1,100	650	10	150	45	30	1,041	2,001	7,500	5,499
42	Misc. Equipment	1,500	1,600	200	10	230	60	20	--	--	--	--
43	Auto Parking - Boat Owners	23,000	200	250	10	230	60	20	7,324	8,074	--	--
44	Auto Parking - Visitors								647	1,852	--	--
45	Auto & Trailer Parking								--	--	--	--
46	Dredging & Excavation	169,200	--	--	--	455	790	100	--	--	--	--
47	Roads and Walks	9,100	--	100	5	455	250	100	--	--	--	--
48	Landscaping & Grounds	4,140	--	100	--	2,250	150	50	--	--	--	--
49	Electric - Power System	37,500	--	--	6	2,250	200	125	--	--	--	--
50	Electric - Flood Light System	14,600	--	--	6	876	200	125	4,909	11,949	--	--
51	Water Lines	23,900	--	--	6	1,374	35	40	--	--	--	--
52	Fire Fighting Equipment	8,500	--	--	3	510	100	75	--	--	--	--
53	Sewer System	29,400	--	--	3	1,470	100	75	--	--	--	--
54	25 Meter Swimming Pool	59,000	700	3,000	6	3,540	225	85	3,346	11,426	7,500	(-) 3,601
55	Tennis Court & Shuffle Board	3,000	150	100	4	120	140	20	--	--	325	--
56	Physical Construction Cost	\$1,132,190										
57	Borough Construction Supervision 2%	22,640										
58	A & E Contracts 5-17%	92,470										
59	TOTALS	\$1,217,100	\$612,150	\$179,900	5.88%	\$50,586	\$8,545	\$8,510	\$131,480	\$990,593	\$1,204,884	\$214,281
												\$ 90,955
												\$153,436
												Net Profit Prior to State and Federal Taxes

In 1966, the Borough adopted a Comprehensive Plan. One of the major proposals of the Plan was the development of a marina at the subject site with an adjoining riverfront park. The "Proposed Land Use Map" is the land use map of the Comprehensive Plan indicating the development of the marina, on-shore facilities, and the adjoining riverfront park area. The "Waterfront Sketch Plan" provides additional details concerning the development of the marina as proposed in the Comprehensive Plan.

The Comprehensive Plan made two (2) significant comments concerning the design of the proposed marina. First, it took a very strong position concerning the need to locate piers and service facilities on the "opposite side of the basin from Mill Street".¹⁰ This was deemed necessary to provide a separation of "contrasting atmospheres". Second, the on-shore facilities were shown to extend across Maple Beach Road to provide area for public recreation facilities. This proposal is no longer feasible as a result of the construction of the water storage tanks in this location.

¹⁰

Bristol Borough Comprehensive Plan, 1966, p. 71.



-  FAMILY HOUSING
-  SPECIAL HOUSING
-  REGIONAL SHOPPING CENTER
-  OFFICE AREA
-  NEIGHBORHOOD SHOPPING CENTER
-  FREE STANDING COMMERCIAL
-  INDUSTRIAL
-  COMMUNITY BUILDINGS
-  PARK AND RECREATION
-  MARINA
-  COLLECTOR STREETS
-  BOULEVARD
-  WALKWAY

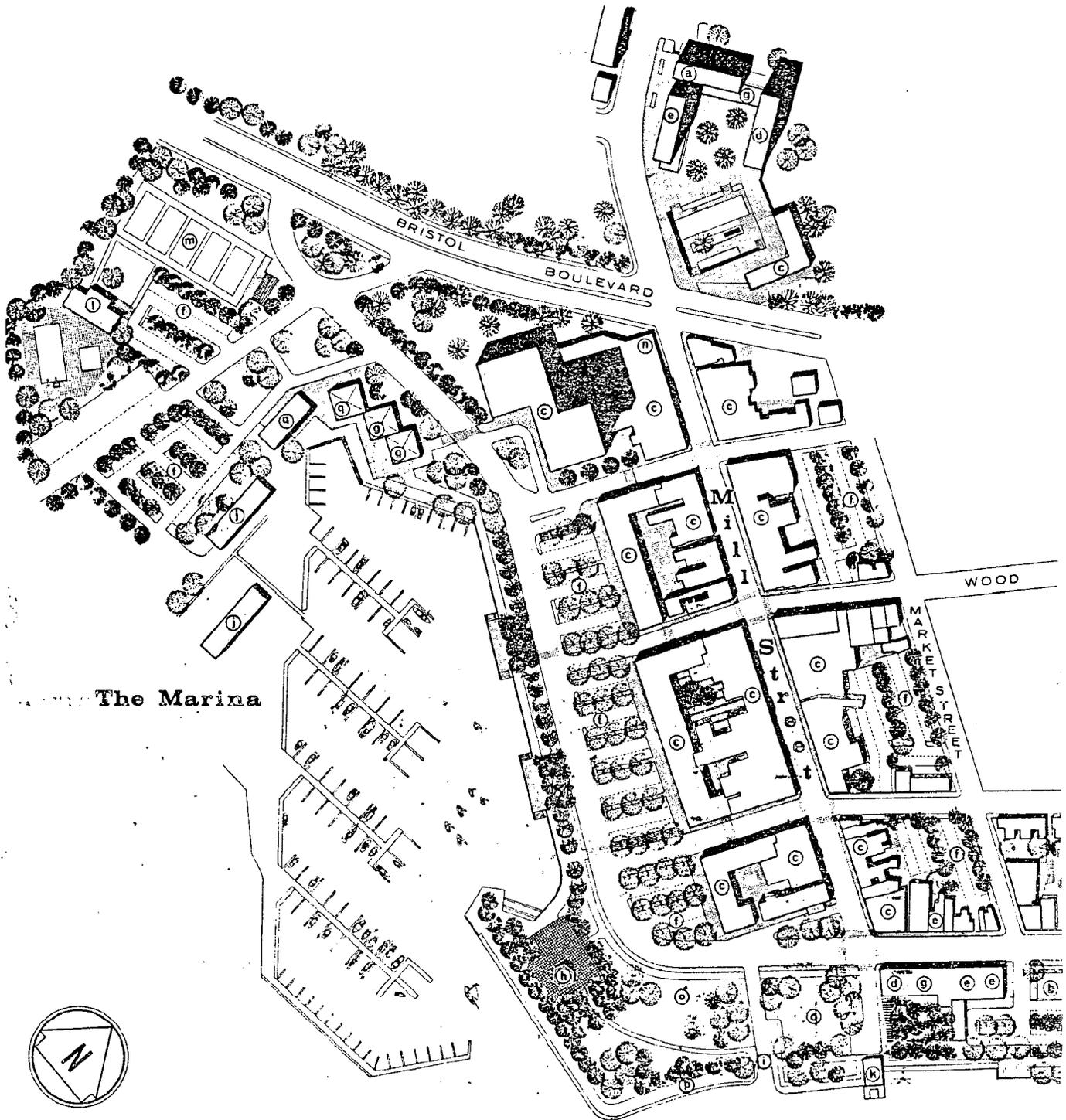
Proposed Land Use

SOURCE: BRISTOL COMPREHENSIVE PLAN - JUNE, 1966

OTTER CREEK MARINA FEASIBILITY STUDY



Bristol Borough, Pennsylvania



The Marina

WATERFRONT SKETCH PLAN

0 100 200 400 600
Scale Foot

BRISTOL BOROUGH PLANNING COMMISSION

SOURCE: BRISTOL COMPREHENSIVE PLAN - JUNE, 1936

- ⊙ The Marina
- ⊙ Mill Street

Commerce

- a. Apartments
- b. Banks
- c. Stores
- d. Hotel
- e. Offices
- f. Parking
- g. Restaurant

Recreation

- h. Band Shell
- i. Boat Ramp
- j. Boat Service and Storage
- k. Pavilion
- l. Swimming Area
- m. Tennis Courts
- n. Theatre
- o. Waterfront Park
- p. Waterfront Walkway
- q. Yacht Club

Following the report prepared by C.A. Chaney & Associates, the Bristol Borough Marina Authority approached the U.S. Army Corps of Engineers to conduct another analysis of the site. This was a desirable course of action because of the potential for assistance in the funding of the project under Section 107 of the River and Harbors Act of 1960.

The Corps of Engineers prepared a "Reconnaissance Report" in 1966 which was followed by a "Detailed Project Report" that was completed in April, 1970. This study determined that the construction of a marina at the mouth of Otter Creek was both "engineeringly feasible and economically justified".¹¹

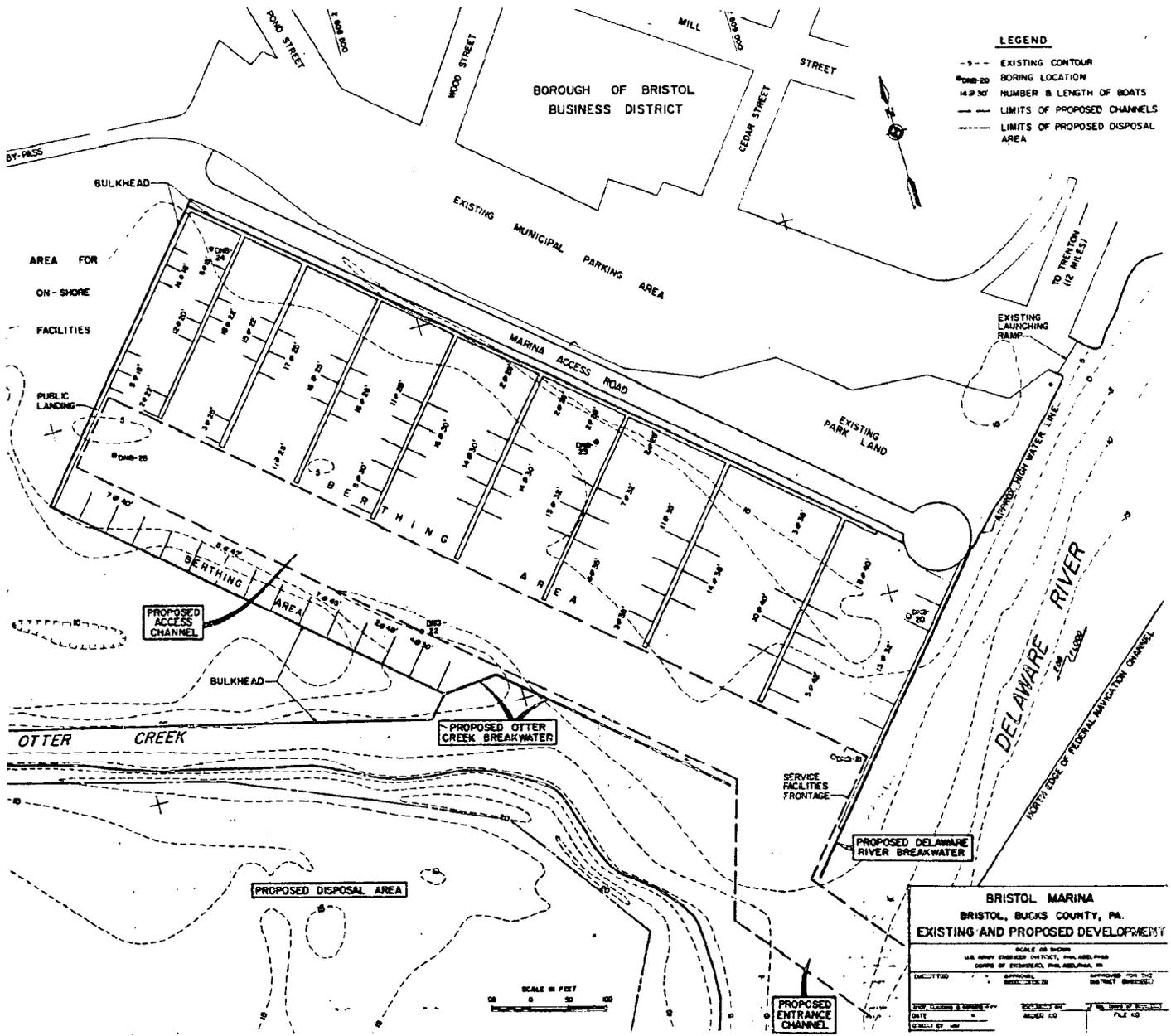
The latter part of this statement requires further explanation. The duty of the Army Corps of Engineers was to determine whether the federal share of the cost of the project was "economically justified". Under the River and Harbors Act this required a determination that the benefits of the project exceeded the federal costs. The federal costs under the River and Harbors Act were limited to 50% of the cost of dredging an entrance channel from the main channel in the river, dredging an interior access channel, and the construction of breakwaters along Otter Creek and the Delaware River. It did not include the costs of dredging the berthing areas, the construction of piers and slips, the installation of bulkheading, and any on-shore facilities.

The costs of the project elements subject to the River and Harbor Act totaled \$630,000, requiring a local share from the Borough of \$315,000. The Borough sought these funds from the Pennsylvania Department of Forests and Waters, and in a November, 1970 amendment to the "Capital Budget Act for Fiscal Year 1969-1970", the sum of \$375,000 was reserved for this project.

Despite the success of the Borough in securing funds from the Department of Forests and Waters, and the very real possibility of receiving the matching grant from the River and Harbors Act, the Borough was unable to secure funds to finance the balance of the project. As a result, in December, 1970, the Capital Budget Act funds were withdrawn.

The plan for the development of the marina prepared by the Army Corps of Engineers is presented in the illustration, Scheme 2. It is important to note that the berthing area is oriented towards the municipal parking lot, a design which contradicts the assumptions of Scheme 1 and the Borough Comprehensive Plan. This design was considered by the Corps of Engineers to be the best engineering solution to the development of a marina at this location. This proposal results in the development of 316 boat slips.

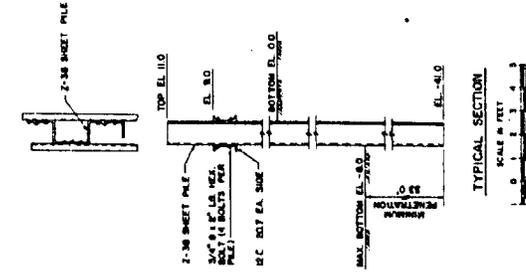
¹¹Detailed Project Report, Small Navigation Project, Bristol Marina, Department of Army, Philadelphia District, Corps of Engineers, April, 1970, p. 2.



Sche 2 Scheme 2

OTTER CREEK MARINA FEASIBILITY STUDY

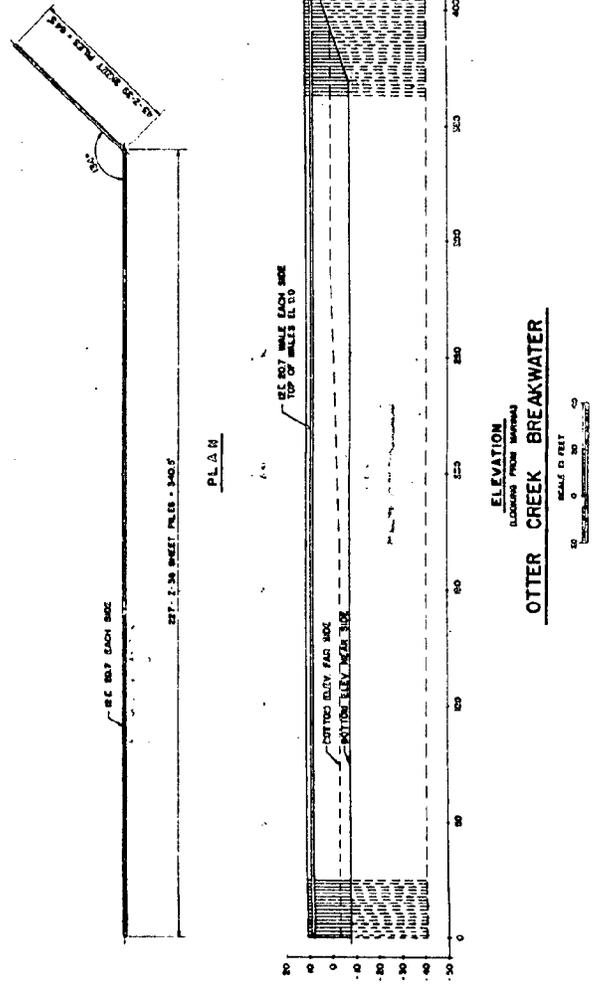
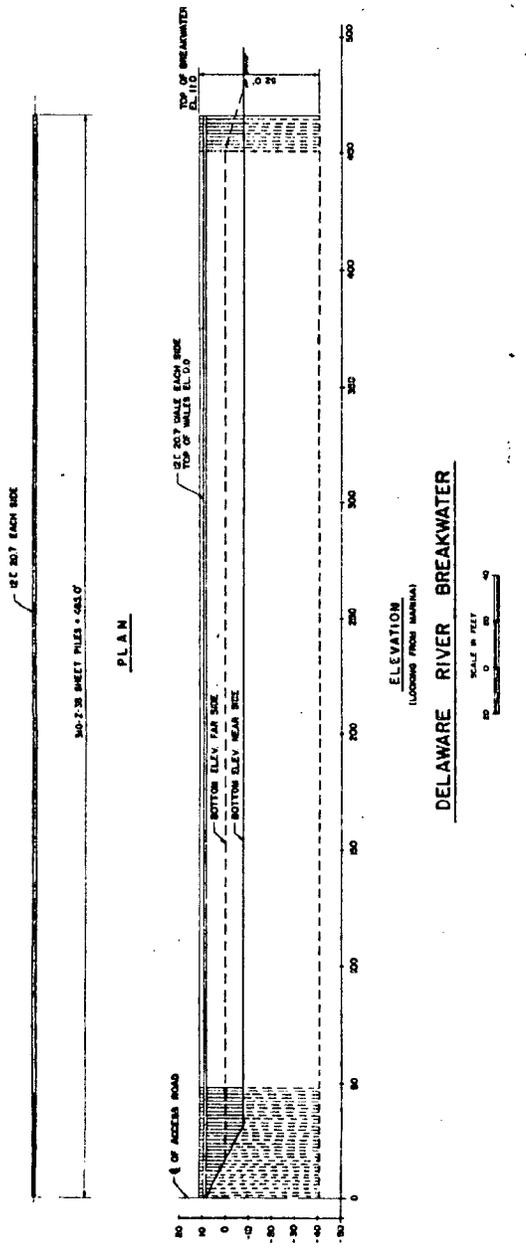
Bristol Borough, Pennsylvania

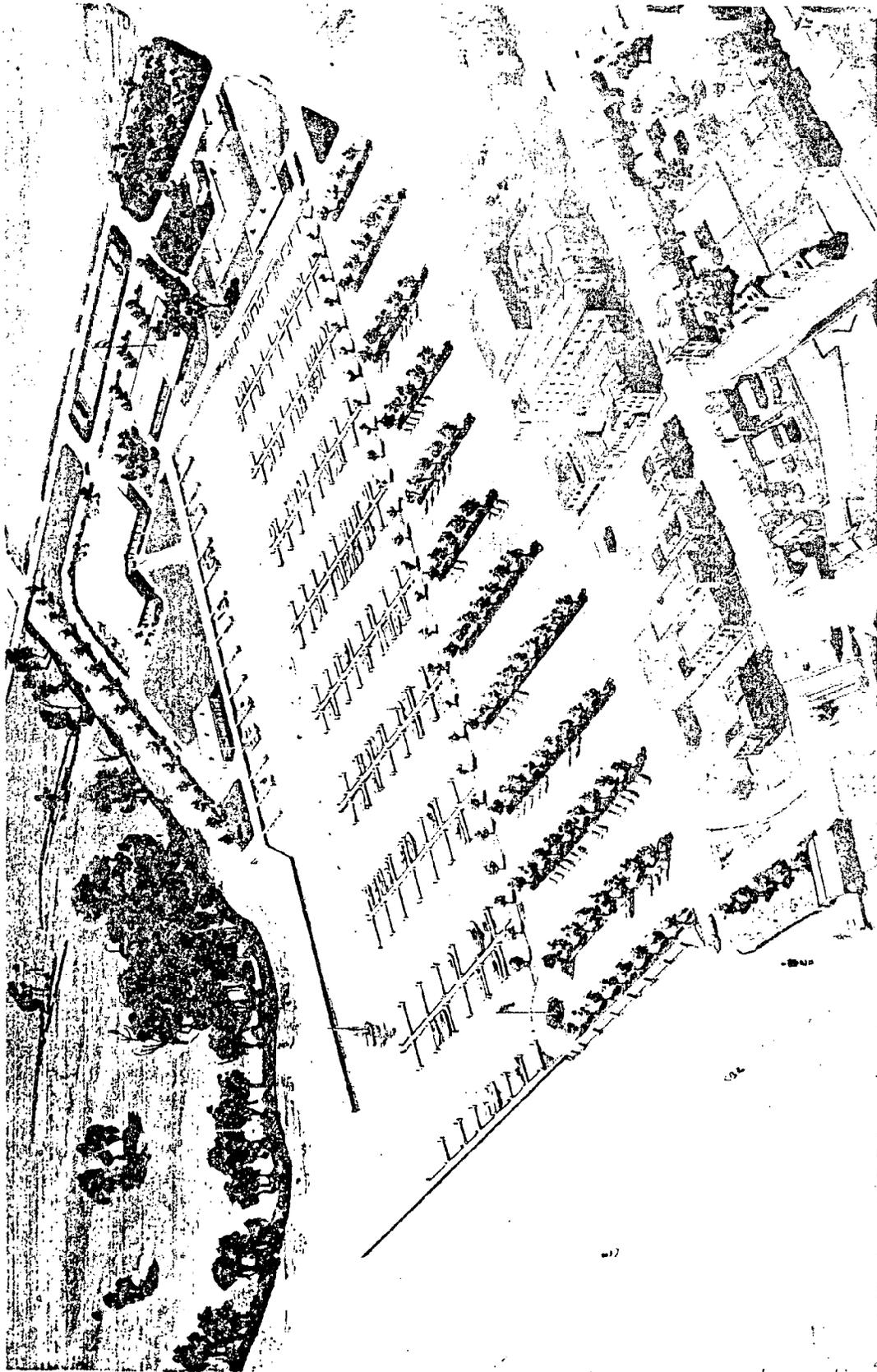


- NOTES**
- 1 ELEVATIONS REFER TO PHILADELPHIA TO TIKETON PROJECT DATUM WHICH IS 2.60' BELOW USCS SEA LEVEL DATUM (SEE ADJUSTMENT)
 - 2 ALL STEEL TO BE CORROSION RESISTANT, HIGH STRENGTH, LOW ALLOY STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI
 - 3 ALL BOLTS TO BE CORROSION RESISTANT, HIGH STRENGTH BOLTS

SCHEME 2

BRISTOL MARINA BRISTOL, BUCKS COUNTY, PA. BREAKWATER DETAILS	
DESIGNED BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
PROJECT NO.	DATE
SCALE	DATE





Artist Rendering of Scheme 2
U. S. ARMY CORPS OF ENGINEERS

MARKET ANALYSIS

A brief market analysis was conducted for each of the prior studies of this site. The 1963 Financial Feasibility Study anticipated a market area that extended 50 to 100 miles from the marina, including all of Bucks County, Montgomery County, one-third of Philadelphia County, and across the Delaware River into Mercer County, and one-third of Burlington County, New Jersey. Within this area it was estimated that there would be as many as 31,230 power and sailboats. The fact that there were very few first class marinas in this vicinity to serve this number of boats suggested that there was a sufficient market to justify the project.

The study prepared by the Army Corps of Engineers in 1970 made a similar finding. This study estimated that there were at least 20,000 boats registered in the service area of the proposed marina, but that there were only 2,000 boat slips in this area. As a result, ". . . many boating enthusiasts from the Philadelphia and Camden areas find it necessary to use berthing facilities in distant waterways, such as those along the Chesapeake Bay or along the New Jersey coastal region. This, however, results in hours of travel for the boating enthusiasts and the limited use of their craft."¹² In summary, the study found that the facilities for recreational boating had not kept pace with the increase in the number of boats, and that a demand existed in this area.

The findings of another, more recent study in this market area generally concur with these studies. A marina study prepared for Falls Township in 1980 included a market study which found that the relative affluence of the market area, the increasing popularity of boating as a form of recreation, and the known demand for boat slips at existing marinas, supported the development of a new marina of 100 to 150 boat slips.¹³ Included in this study was support for the position that there is an increasing demand for boating facilities closer to the boat owner's residence, as was stated in the Corps of Engineers' study. The Corps of Engineers' study supported this position on the basis of a boat owner's desire to avoid long trips in a car to the site of his boat as this time was better spent using his boat. The Falls Township study recognized the increasing cost of fuel as the prevailing factor. It was proposed that boat owners would prefer to save the cost of fuel expended to travel to distant marinas to provide funds to operate their boats, perhaps more often.

¹²Detailed Project Report, Small Navigation Project, Bristol Marina, U.S. Department of Army, Philadelphia District, Corps of Engineers, April, 1970, p. 8.

¹³Falls Township Waterfront Recreation Study, UNIPLAN and Economic Research Associates.

TABLE I
UPPER DELAWARE RIVER BOAT ACCESS AREAS

	<u>Number Of Slips</u>	<u>Seasonal Slip Rental</u>	<u>Dry Storage Capacity</u>	<u>Storage Rental</u>	<u>Boat Ramp</u>	<u>Crane/Boat Lift</u>
<u>PENNSYLVANIA, Bucks County:</u>						
1. Morrisville:	-	-	-	-	(Proposed)	-
2. Pennsbury Manor:	(125 Proposed)	-	-	-	(Proposed)	-
3. Bristol Yacht Club:	N/A	Private Facility	-	-	-	-
4. Anchor Yacht Club:	N/A	Private Facility	-	-	-	-
5. Bristol/Pennsylvania Fish Commission:	-	-	-	-	Public	-
6. Neshaminy State Park Ramp:	-	-	-	-	Public	-
7. Neshaminy Marina:	160 (40 Additional Proposed)	\$290/\$370	-	-	Yes	-
8. Jack's Neshaminy Marina:	200	\$200/\$300	100	N/A	Yes	< 20 Ton Crane < 20' Fork Lift
9. Seyfert & Wright Boat Yard:	65	\$225/\$450	180	N/A	Yes	25 Ton
10. Eckart's Marine Service:	12	N/A	35	\$5.50/Foot	Yes	< Hydraulic Trailer Hauling to 30'
11. Snug Harbor Marina:	200	\$190+	200	\$7.00/Foot	Yes	20 Ton Mobilift
12. Frank Malone Marina, Inc.:	-	Not In Operation	-	-	-	-
13. Ed's Boat Yard:	-	-	35	\$100/Winter	-	-
14. Pennsylvania Yacht Club:	N/A	Private Facility	-	-	-	-
15. Delaware Access Area:	-	-	-	-	Public	-
16. Salem Harbour Marina:	<u>90</u>	N/A	<u>N/A</u>	N/A	No	20 Ton Boat Lift
SUBTOTAL:	727 (165 Additional Proposed)		500			
<u>NEW JERSEY, Burlington County:</u>						
17. Curtin Marina:	<u>90</u>	\$200/\$600	25 Inside 150 Outside	\$21.00/Foot \$ 9.00/Foot	Yes	7 Ton Crane
SUBTOTAL:	90		175			
<u>PENNSYLVANIA, Northeast Phila.:</u>						
18. Delaware River Yacht Club:	N/A	Private Facility	-	-	-	-
19. Columbia Yacht Club:	N/A	Private Facility	-	-	-	-
20. Philadelphia Municipal Launching Ramp:	-	-	-	-	Public	-
SUBTOTAL:	N/A		N/A			

Source: Boating Almanac 1981, Volume 3.

The approach taken in these studies, to approximate the number of existing and potential boat owners, and to examine the occupancy at existing marinas, is appropriate to determine that there is a demand that is at least in excess of the existing supply. However, it does not provide us with a clear indication of how much additional demand there is beyond existing supply. This information is desirable because there are additional marina facilities planned in Falls Township and at the Neshaminy State Park Marina. The following is a further examination of available data in an attempt to make such an estimate.

Table II indicates the number of boats potentially owned by Bucks County residents. Potential ownership is based on national averages for boat ownership by household income. Table III indicates the number of boats actually registered to residents of Bucks County and adjoining counties.

TABLE II

<u>Distribution of Family Income</u>	<u>Number Of Households In Bucks County</u>	<u>Percent Of Households Owning A Boat</u>	<u>Potential Number Of Boats</u>
Under \$15,000	23,000	33%	1,150
\$15,000 - \$25,000	49,017	43%	5,882
\$25,000 - \$50,000	50,777	43%	6,093
Over \$50,000	6,975	33%	697
			13,822

Sources: A.C. Nielson Sports Survey,
Falls Township Waterfront Recreation Study,
Direction Associates, Inc.

TABLE III
REGISTERED MACHINERY-DRIVEN PLEASURE BOATS

<u>County</u>	<u>1972</u>	<u>1980</u>	<u>Change</u>	<u>Percent Change</u>	<u>1980 Population</u>	<u>Percent Change</u>
Bucks	4,512	7,598	3,086	+68.4	479,211	+15.0
Montgomery	4,102	5,993	1,891	+46.1	643,621	+ 3.1
Philadelphia	3,666	4,209	543	+14.8	1,688,210	-13.4

Source: Pennsylvania Fish Commission/Boat Registration Division.

Note: In Pennsylvania, all boats operated by propelling machinery (motorboats) must be registered. Sailing vessels, canoes, etc., need not be registered. A motorboat must be registered in the state in which the boat is principally used. If the boat is waterborne in Pennsylvania waters more times than it is on waters of another

state, it must be registered in Pennsylvania, regardless of where the owner lives. Boats registered in other states are granted reciprocal privileges in Pennsylvania for a period of sixty (60) days.

While it is not surprising that the actual number of boats registered to Bucks County residents is less than the potential shown in Table II, the difference is substantial. This is due in part to the fact that not all boats must be registered (see Note, Table III). However, it also reflects the fact that boat owners need not register boats in their resident state. In fact, there are advantages, often significant, to purchasing, registering, and storing boats, particularly larger, more expensive boats, in states where there are no sales or property taxes for boats. As a result, we are able to say that there are at least 7,598 boat owners in Bucks County, that these boats are principally used in Pennsylvania, but that there are probably many more boat owners who register and store their boats in other states. These boat owners constitute the potential market that is expected to be drawn closer to their place of residence for recreational boating. Unfortunately, however, their number cannot be determined from the available data.

Nor can we determine the number of boats registered in Pennsylvania or owned by Pennsylvania residents that are likely to be stored in marinas. Boat registration makes no reference to the size of boats, nor to the number of boat trailers. As a result, we do not know the number of boats that presently use, or could use, trailers for access and storage purposes.

The lack of available data from which to draw closer to an estimate of the gap between existing facilities and the actual market presents a serious problem in recommending additional marina facilities. There is, however, one further source of information which provides us with a basis for justifying the construction of a marina. Table IV indicates the characteristics of the boats renting slips at the Neshaminy State Park Marina in 1981 and also provides us with a "waiting list" of persons desiring to rent a slip. The present waiting list (374 boats) exceeds the number of slips proposed under the larger plan for the Bristol Marina (316), as well as the number of slips that will soon be added to the Neshaminy State Park Marina (40).

It is very likely that the present demand for boat slips exceeds the number represented in this waiting list and may well exceed the full development potential of the Neshaminy State Park Marina (120 additional slips), the Falls Township/Pennsbury Manor proposals (150 slips maximum), and the Bristol Borough Marina (316 slips). It is also apparent from the information presented in Table I, that a first class, full service marina would be desirable in this area. As a result, any proposal for the development of a marina should give careful consideration to providing as many on-shore boating service facilities as possible.

TABLE IV
NESHAMINY STATE PARK MARINA

1981 SLIP RENTALS

<u>BOAT SIZE</u>	<u>NUMBER</u>
<u>< 25'</u>	85
26' - 30'	55
> 30'	<u>18</u>
	158 Boat Slips
	<u>2</u> Transient
	160 Total

WAITING LIST

<u>BOAT SIZE</u>	<u>NUMBER</u>
<u>< 25'</u>	260
26' - 30'	81
31' - 35'	22
> 35'	<u>11</u>
	374

Source: Neshaminy State Park Office.

Table IV is the only available data for the size of boats in marinas, or desiring to use marinas, in the upper Delaware River. In designing a marina, it is necessary to determine a "boat-mix", i.e., the number of slips serving boats of varying lengths. This controls the total number of slips provided and, therefore, the income potential of the marina. Over 90% of the boats on the waiting list are less than 30 feet, and 70% of the boats on the list are less than 25 feet. This information supports the projections of the earlier studies of A.C. Chaney, Inc. and the Army Corps of Engineers. The "boat mix" proposed in each of these studies is presented below in Table V.

TABLE V
MARINA CAPACITY BY BOAT SIZE

<u>Boat Length</u>	<u>A.C. Chaney: 1963 Number of Slips</u>		<u>Corps of Engineers: 1970 Number of Slips</u>
16	16		16
18	11		11
20	12		12
22	35	64%	35
25	36		36
28	28		36
30	20		52
32	22		33
35	16		17
38	20		17
40	11		25
42	8		13
45	7		7
48	2		2
50	<u>2</u>		<u>4</u>
TOTAL:	246		316

Although the "boat mix" presented in both proposals has a smaller share of slips for boats less than 30 feet than appears on the waiting list, there are certain industry trends which suggest caution in this area. Energy costs have resulted in an increasing demand for smaller boats; smaller boats are able to make use of boat trailers. The following comment was made by an individual reviewing the 1981 Boat Show:

"As fuel costs increased in recent years, boaters turned in droves to smaller boats and cost-efficient diesel power. This trend seems to be continuing, and at this year's show you can see it reflected in the large number of medium-sized fishing and cruising boats in the 22' to 34' range on display.

The smaller-is-better trend can also be seen in the number of trailerable boats — both sail and power."¹⁴

It is possible, therefore, that many of the 260 boats under 25 feet on the waiting list are able to be served by a trailer, and as energy costs rise, this alternative may be preferred over the annual lease of a boat slip. The larger boats, however, require the use of a boat slip, and the effect of rising energy costs on these boats will be to bring more of them back from the Jersey shore, closer to the residence of the owner.

¹⁴For Those Who Sail the Bounding Main", Outdoor; Philadelphia Inquirer, September 11, 1981.

SITE SUITABILITY AND DEVELOPMENT ALTERNATIVES

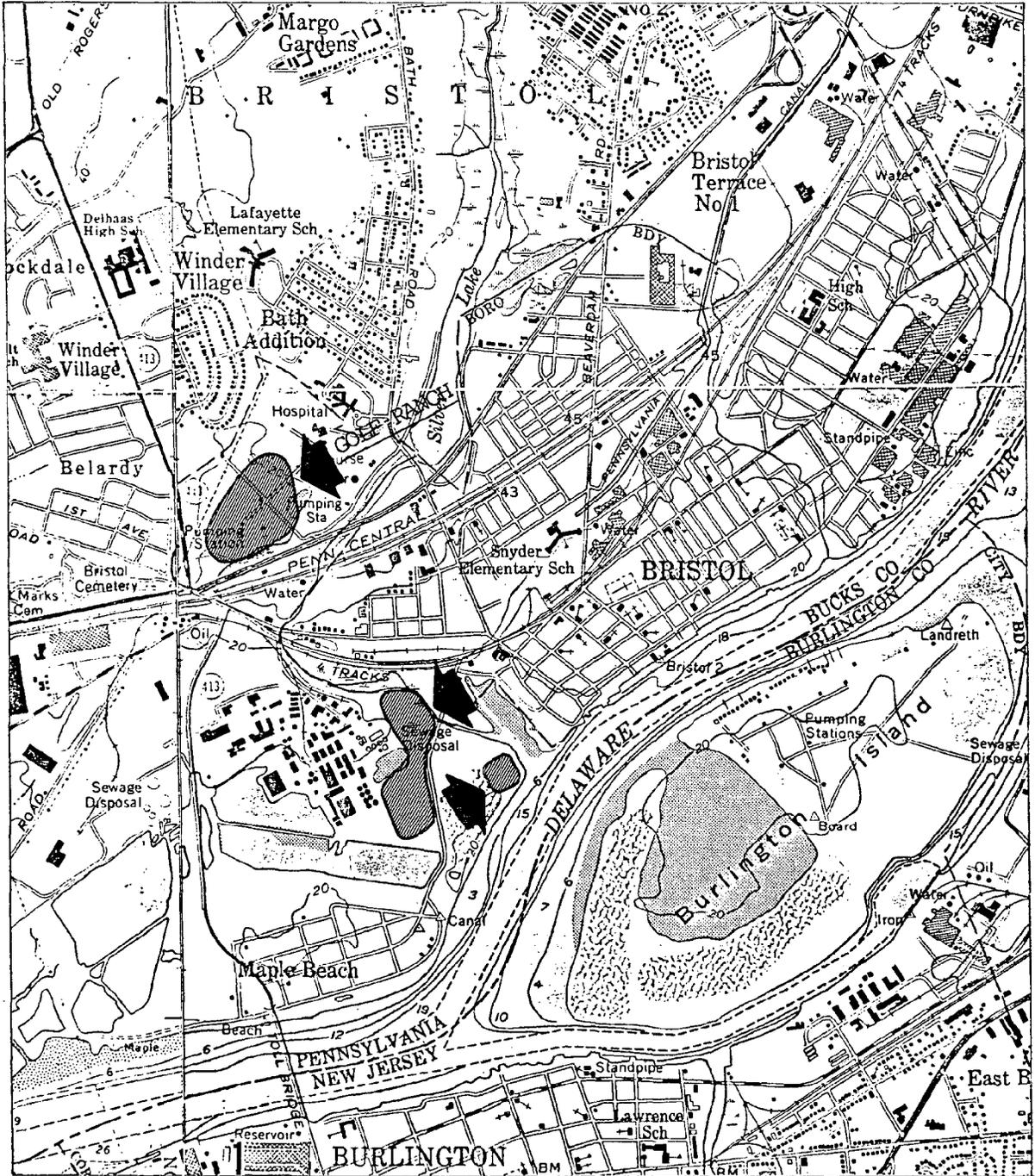
The Otter Creek basin provides a unique opportunity to construct a riverfront marina in a location that offers natural protection from the currents and wave action of the river. The study prepared by the Army Corps of Engineers in 1970 concluded that the construction of a marina at this location was ". . . practicable and justified and that the site selected is the most suitable for the construction of a marina".¹⁵

Earlier sections of this study have, however, identified the fact that there are problems related to the dredging of the basin as it has been recognized as a tidal wetlands. As a result, it is quite possible that various agencies reviewing the necessary permit applications for this project will express concern over this issue. However, the wetlands legislation does not impose an absolute ban on such activities, and it is believed that the benefits of water-related recreation afforded by the development of a marina may be judged to exceed the adverse effects of the loss of this relatively small area of wetlands.

An additional problem generated by dredging activities is the ability to secure a site which is acceptable to the Pennsylvania Department of Environmental Resources and the Army Corps of Engineers for disposing the dredged materials. These sites have become fewer over the years. One such site has been identified adjacent to Otter Creek. This site is presently under lease by the private contractor responsible for the maintenance dredging of the channel in the Delaware River. This is a possible site for disposal. Other possible sites are identified on the map on the following page. These include areas adjoining the Borough's Sewage Treatment Plant or the Golf Ranch property. The Golf Ranch site has been submitted to the Department of Environmental Resources for consideration as a future disposal site.

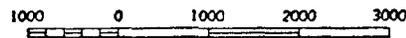
It should be noted that the location of the disposal site is very important. The farther this site is from the point of dredging, the greater the cost. The recent dredging of the channel in the Delaware River cost less than \$3.00 a cubic yard; however, difficulty with a disposal site can raise that cost to \$7.00 a cubic yard.

¹⁵Detailed Project Report, Bristol Marina, Delaware River, Bucks County, Pennsylvania. Department of the Army, Philadelphia District, Corps of Engineers.



Potential Disposal Sites

**OTTER CREEK MARINA
FEASIBILITY STUDY**



Bristol Borough, Pennsylvania

The development of a marina suggests the development of certain on-shore boating service facilities. The extent to which such facilities are provided relates to the "public" nature of the proposed marina and to the physical capacity of the site. Also, this study requires that on-shore public recreational facilities be considered in the adjoining land areas.

The A.C. Chaney report proposed the development of both boating service facilities and public recreational facilities. These included a restaurant, boating sales, boat repair, and boat storage facilities; and public recreational facilities such as a swimming pool, tennis courts, and "social activities" building. The principal limiting physical feature in the adjoining on-shore area is its flood-plain status. While the boundaries of the "floodway" and "floodway fringe" may experience some change as a result of the dredging and fill activities associated with the project, it is likely that much of the site will remain within the boundaries of the floodway fringe. As a result, the following considerations must be made for the proposed on-shore development.

The development of a public swimming pool and a "social activities" building or community center should not be located within a flood prone area. Such a location is unacceptable for a swimming pool and would only raise construction costs for the social activities building. While open-space recreational facilities such as a tennis court are appropriate for development in a flood plain, there is some question concerning the desirability of placing such public facilities in this area. Stated simply, benefit to the public as a result of placing such facilities in this adjoining land area is not significant. There are other locations in Bristol suitable for the development of the proposed public recreation facilities that are free of flood plain limitations. It is recommended that they not be included in the development proposed for this site.

The analysis of on-shore boating service facilities presents different problems. Any area designated as a "floodway" prohibits the placing of structures and the storage of bouyant materials and equipment. However, such development may occur within "floodway fringe" areas provided the structures are floodproofed or raised to an elevation of 1½ feet above the level of the 100 year flood. In the case of the storage of boats, this should not occur in open areas, but rather within floodproofed structures.

While it appears that necessary boating service facilities can be provided in the on-shore areas, there remain several important questions concerning the ability to provide such services in a "public" marina.

The A.C. Chaney study included in the total development cost of the project, the costs of boating service facilities including a boat sales facility, boat storage facilities, and a restaurant which would operate out of the "social activities" building. These facilities served a very important function in this proposal, as they provided the bulk of the income needed to finance the project. Without all or part of these facilities, the project could not support itself.

While it may be appropriate for a public marina to provide land or structures for lease or purchase by private enterprise, it is not appropriate for the public sector to actually operate such facilities as a restaurant or the sale of boats. As a result, the income from the operation of the restaurant and the income from the sales of boats should not be included in the income projection of a public marina. The alternatives considered in this study will allow space for the development of such facilities, but will not include either their cost or their income in this analysis. Only the possible development cost and income from enclosed dry storage of boats will be considered in the public operation of this facility in addition to the operation of the berthing facility.

It should be emphasized that this study finds that it is highly desirable to provide for a full range of on-shore boating facilities. However, it is the position of this study that the public sector should only participate in the operation of certain limited services and should not make projections on the basis of incomes for facilities which are more appropriately operated by the private sector.

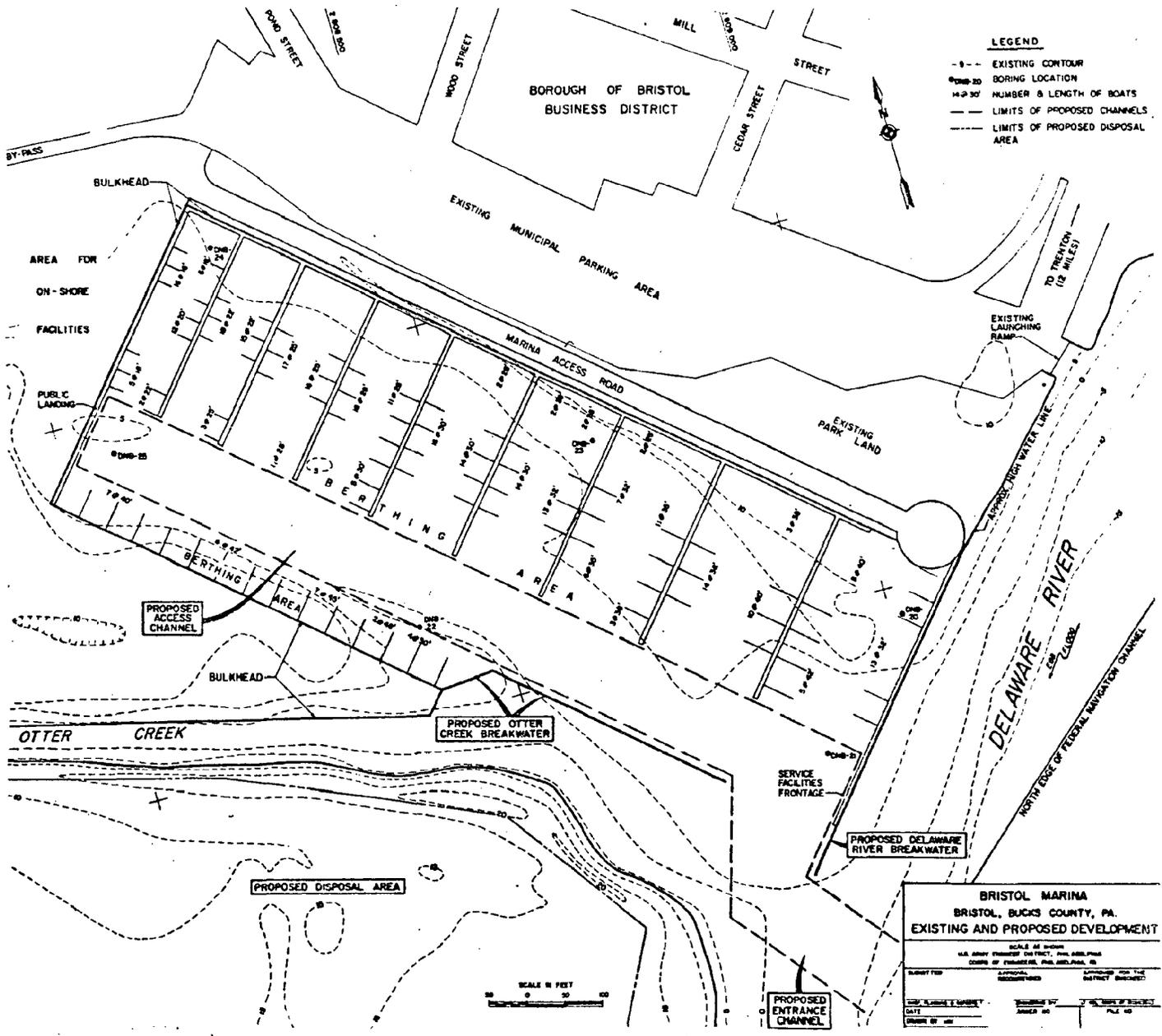
One final consideration remains in addressing the limitations and suitability of the site for marina development. This relates to existing uses on the site and adjoining the site. The single developed use which occupies the site is the Borough garage and maintenance yard. This use is an important use to the Borough; its loss requires its replacement at another site. Recently the Borough investigated the cost of replacing this structure. Estimates for the building alone ranged from \$93,000 to \$140,000.

It is possible, with appropriate buffering, to continue the present use in this location. It is also possible to convert the existing building for use in the operation of the marina. Alternatives considered in this study will include the Borough garage at its present location.

The adjoining land use of interest to this project is the municipal parking lot. This facility is not used to capacity, and it can be expected that parking demand generated by the marina can be met by use of this facility as well as parking provided on-site.

As a result of this analysis, the development alternatives to be considered in this study are two variations of the plan prepared by the Army Corps of Engineers (see Scheme 2). The berthing facilities of the marina will remain as presented by the Corps of Engineers, providing a total of 316 boat slips in the boat mix presented in Table V.

There will be no public recreational facilities provided in the on-shore areas. The public development in the on-shore areas will be limited to boat storage buildings, parking and driveways, marine gas station and travel-lift/forklift equipment. Additional on-shore facilities will be encouraged, but will not be developed or operated as public facilities.



LEGEND

- - - - - EXISTING CONTOUR
- BORING LOCATION
- 14'-0" x 24" NUMBER & LENGTH OF BOATS
- - - - - LIMITS OF PROPOSED CHANNELS
- - - - - LIMITS OF PROPOSED DISPOSAL AREA

BRISTOL MARINA	
BRISTOL, BUCKS COUNTY, PA.	
EXISTING AND PROPOSED DEVELOPMENT	
SCALE AS SHOWN	
U.S. ARMY CORPS OF ENGINEERS, PHILADELPHIA, PA.	
CORPS OF ENGINEERS, PHILADELPHIA, PA.	
SUBJECT: BRISTOL MARINA	
APPROVED: [Signature]	
DATE: [Date]	
DRAWN BY: [Name]	
CHECKED BY: [Name]	
DATE: [Date]	
SCALE: 1" = 100'	
SHEET NO. 2 OF 2	

Scheme 2

**OTTER CREEK MARINA
FEASIBILITY STUDY**

Bristol Borough, Pennsylvania

PROJECT PHASING AND FINANCING

The financing of a public marina is normally dependent upon grant funds to subsidize the capital outlay necessary for construction. At the outset of this study it was anticipated that such grant funds might be available to the Borough from the same source that provided funds for the study, the Coastal Zone Management Program. Unfortunately, the recent Federal budget cuts have not spared this program. Capital funds for the development of recreational opportunities in the Coastal Zone under Section 306 of the Coastal Zone Management Program are no longer available.

The Federal budget cuts have also affected other programs that normally might be a source of funds for such a project. The Economic Development Administration of the Department of Commerce has been a source of funds for such projects in the past; there are no funds available for new projects in fiscal 1982. Similarly, the Federal Land and Water Conservation Fund which is administered at the state level by the Bureau of Recreation and Conservation of the Pennsylvania Department of Community Affairs received no new funding in fiscal 1982; and it may be eliminated entirely in 1983.

Another possible source of funding for this project is the Pennsylvania Fish Commission. The Fish Commission provides funds for the development of boating access areas. However, the Commission has already funded the boat ramp in the Borough's Municipal parking lot and its present list of projects exceeds its budget capacity. As a result, funding from this source is doubtful.

Viewed from the standpoint of obtaining the necessary start-up funds to begin construction of the marina, the project is presently not feasible. This is demonstrated in the tables presented on the following pages where the sources of financing capital costs are assumed to be:

- 1) General obligation bond.
- 2) Grant for construction cost (50%) of the access channel and breakwaters under Section 107 of the Harbor and Rivers Act.

The purpose of presenting the information shown on Tables VI through IX is to provide an understanding of the relative costs and anticipated income that might be generated by the project. However, the general obligation bonds in the amounts indicated are

not a practical alternative, as they pledge the taxing power of the Borough to make up any deficits. Also, it is doubtful that the Borough has the ability to secure general obligation funds for these amounts. Similarly, the ability of the Borough to secure grant funds under Section 107 of the Harbor and Rivers Act is not certain. While the Corps of Engineers appeared willing to fund the project in 1970, there is considerable question with regard to their position on this project at this point in time, as the recent Federal budget cuts have resulted in a freeze on all new development of recreational projects under Section 107.

TABLE VI
 SCHEME 2
 OTTER CREEK MARINA
 DEVELOPMENT COSTS

<u>CHANNEL:</u>		<u>ON-SHORE IMPROVEMENTS:</u>	
Dredging - 68,900 cubic yards @ \$4.00/cubic yard: \$ 275,600		Land Acquisition - 2.6 acres @ \$20,000/acre:	\$ 52,000
Breakwater - 1970 Estimate plus 25%: \$ 750,875		Clearing/Excavation:	\$ 25,000
$\frac{\$1,026,475}{2}$	= \$ 513,238	Parking/Driveway:	\$ 50,000
Local Share:		Boat Storage Buildings:	\$ 113,000
		Travel Lift/Forklift:	\$ 55,000
<u>BERTHING AREA:</u>		Landscaping:	\$ 30,000
Dredging - 106,000 cubic yards @ \$4.00/cubic yard:	\$ 424,000	Marine Gas Station:	\$ 15,000
Bulkhead - 2,050 feet @ \$385/ foot:	\$ 789,250		
Piers/Slips - 316 @ \$2,100/slip:	\$ 663,600		
<u>OTTER CREEK:</u>			
Bulkhead - 900 feet @ \$350/foot:	\$ 315,000		
			\$ 340,000
		TOTAL:	\$3,045,088

1 50% of the costs would be provided by a grant under Section 107 of the River and Harbor Act of 1960, as amended.

TABLE VII
 SCHEME 2
 OTTER CREEK MARINA
 ANNUAL OPERATIONS

<u>INCOME</u>	<u>OPERATING EXPENSE</u>
<u>SLIP RENTAL:</u>	
316 @ \$400/slip:	\$ 75,000
Transient Slip Rental:	
Dry Storage - 200 @	
\$175 Average Boat:	\$ 30,000
Concession Rental:	
Electricity Use Charge:	
	<u>\$105,000</u>

Net Annual Income: \$ 75,400

Average Annual Debt Service
 (General Obligation Bond
 \$3,000,000; 20 Years @ 13.5%): \$440,000

Annual Deficit (\$364,600)

TABLE VIII

SCHEME 3

OTTER CREEK MARINA
DEVELOPMENT COSTS

<u>CHANNEL:</u>	<u>ON-SHORE IMPROVEMENTS:</u>
Dredging - 68,900 cubic yards @ \$4.00/cubic yard: \$ 275,600	Clearing/Excavation: \$ 25,000
Breakwater - 1970 Estimate plus 25%: \$ 750,875	Parking/Driveway: \$ 50,000
	Landscaping: \$ 15,000
	Marine Gas Station: \$ 15,000
Local Share: = \$ 513,238	
<u>BERTHING AREA:</u>	
Dredging - 106,000 cubic yards @ \$4.00/cubic yard: \$ 424,000	
Bulkhead - 2,050 feet @ \$385/ foot: \$ 789,250	
Piers/Slips - 316 @ \$2,100/slip: \$ 663,600	
	\$2,390,088
	TOTAL: \$2,550,088

TABLE IX
 SCHEME 3
 OTTER CREEK MARINA
 ANNUAL OPERATIONS

<u>INCOME</u>	<u>OPERATING EXPENSE</u>
<u>SLIP RENTAL:</u>	
316 @ \$400/slip:	\$ 65,000
Transient Slip Rental:	\$ 20,000
Concession Rental:	
Electricity Use Charge:	<u> </u>
	<u>\$ 85,000</u>

Net Annual Income: \$ 60,400

Average Annual Debt Service
 (General Obligation Bond
 \$2,500,000; 20 Years @ 13.5%): \$367,000

Annual Deficit: (\$306,600)

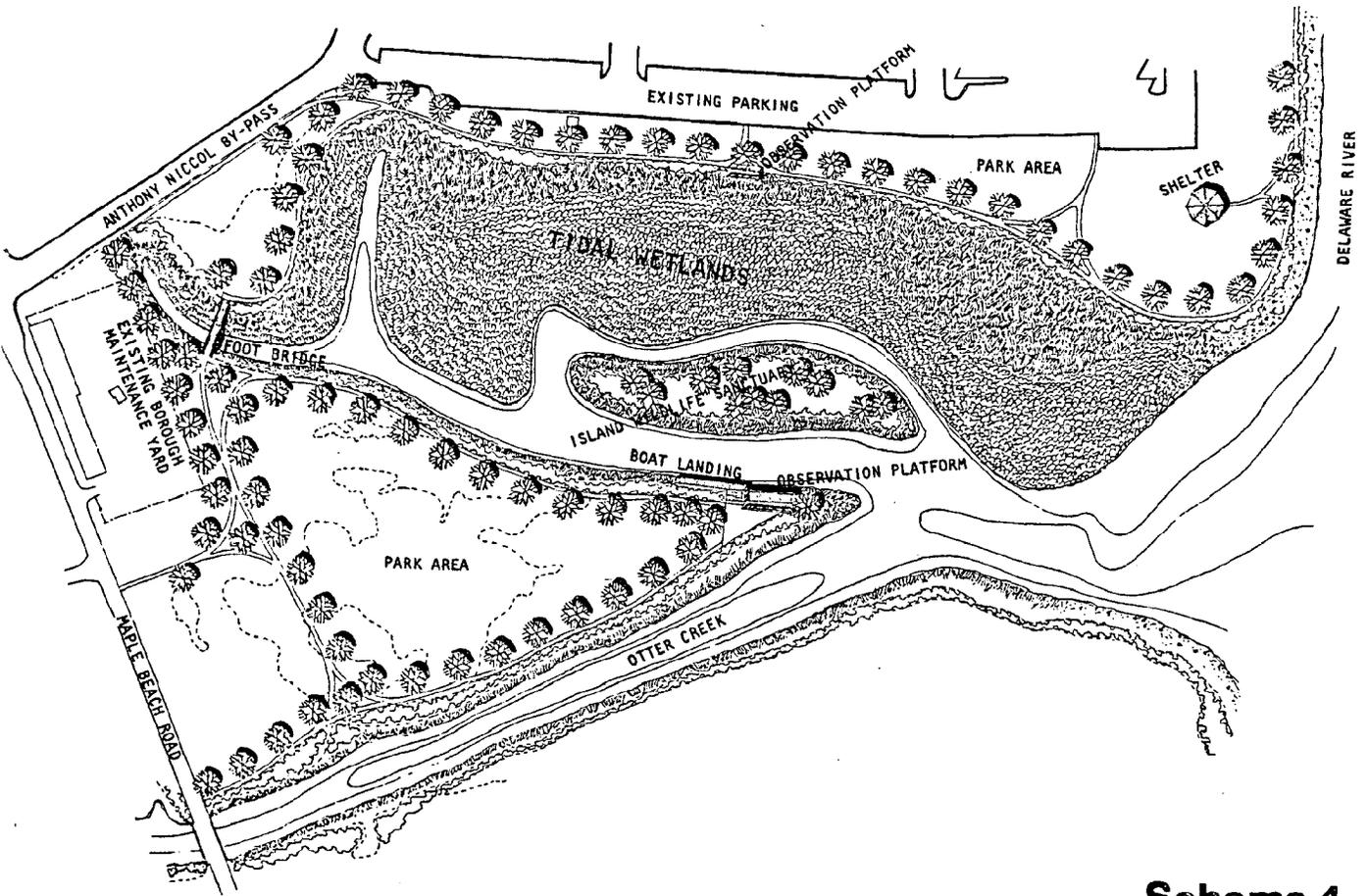
It is the recommendation of this study that the Borough continue to seek sources of funds for this project. We recommend the "wait and see" approach for this project because of the considerable controversy regarding Federal budget cuts and their effect on existing Federal and State grant programs. Should the "new federalism" be followed to the extent that it is now proposed, State government rather than Federal government may assume responsibility for funding programs for which this project may qualify. This recommendation is fostered by the opinion that there is sufficient demand to occupy the proposed number of boat slips, and by the realization that significant benefit would accrue to the Mill Street Business District and the image and the economy of the Borough.

If necessary, the initial capital costs can be reduced by constructing the piers and slips in phases in a manner similar to the construction phasing of the Neshaminy State Park Marina. The total projected boat slips for the Neshaminy Marina is 320; the initial phase of construction provided for the full dredging and bulkheading, but included only 4 piers for a total of 160 slips.

Because this process is uncertain, it is important that the Borough consider at least one other alternative for this site. The site is presently in an unattractive condition with a considerable amount of trash and other waste materials deposited on the shoreline. If funds to assist in the subsidy of a public marina cannot be secured, the Borough may wish to consider designating the area as a natural park area.

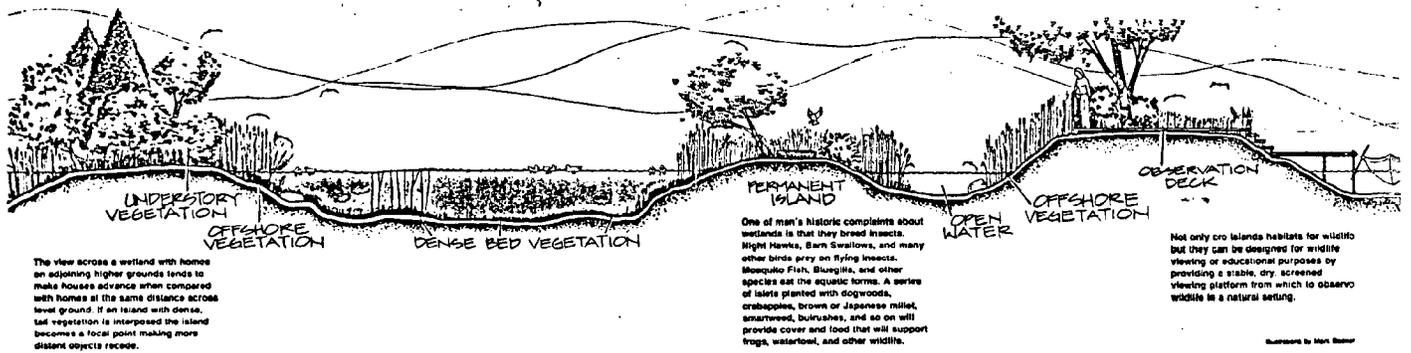
Scheme 4 is a proposal for converting the Otter Creek Basin to a wetlands preservation area, the Bristol Environmental Center. This plan envisions a walkway/bicycle path linking the present waterfront park to the basin. Funds are reserved for a general cleanup of the area and the provision of landscaping, particularly in the area of the Borough garage and maintenance yard. The peninsula area between Otter Creek and the basin would be a passive natural recreation area with an observation deck to view the vegetation and wildlife occupying the wetlands. Wildlife habitat could be encouraged by the development of a small island in the basin formed by dredging a channel around the island and depositing the dredged material on the island. The dredged channel would allow small craft to enter the area and a small boat landing would be provided on the basin side of the peninsula to serve these craft.

This project could be undertaken as presented for approximately \$161,000. The project could also be undertaken at a reduced scale without dredging and creating an island. This would reduce costs to approximately \$70,000. These funds could be sought under the Community Development Block Grant Program of the Department of Housing and Urban Development. The Borough presently receives funds on an annual basis under this program and the type of project described in Scheme 4 would be eligible for funding.



Scheme 4

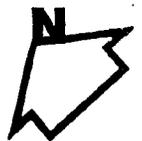
Typical Wetlands Environment



NatureScope January 1982

OTTER CREEK MARINA FEASIBILITY STUDY

0 100 200 300



Bristol Borough, Pennsylvania

SCHEME 4
 BRISTOL ENVIRONMENTAL CENTER
 DEVELOPMENT COST

Dredging - 23,000 cubic yards @ \$4.00:	\$ 92,000
Land Acquisition:	\$ 30,000
General Cleanup - Dead Trees, Rubbish, and Debris:	\$ 3,500
Landscaping:	\$ 15,000
Walkway - 4,000 lineal feet:	\$ 6,500
Park Benches (10):	\$ 2,000
Observation Decks (2):	
20' x 30' @ \$15.00/square foot:	\$ 9,000
10' x 20' @ \$15.00/square foot:	<u>\$ 3,000</u>
	\$161,000

APPENDICES

APPENDIX I

DEED, DELAWARE COUNTY BASIN

THIS INDENTURE

MADE AND ENTERED into this 15th day of August
in the year of our Lord, one thousand nine hundred and
forty-seven (1947),

BETWEEN the COMMONWEALTH OF PENNSYLVANIA, act-
ing by and through the Secretary of the Department of
Property and Supplies, with the approval of the Governor,
party of the first part,

A

N

D

the Borough of Bristol, situate in the County of Bucks
and Commonwealth of Pennsylvania, party of the second
part:

WHEREAS, the Act of May 1, 1947, P. L. ,
Act No. 53 authorizes and empowers the Department of
Property and Supplies with the approval of the Governor,
to grant and convey to the Borough of Bristol in County
of Bucks and Commonwealth of Pennsylvania, the two tracts
of land hereinafter described, in consideration nevertne-
less, of the Borough of Bristol perpetually maintaining
the said tracts only for a park and parking facilities
connected therewith.

NOW THIS INDENTURE WITNESSETH, under authority
of the Act of May 1, 1947, P. L. , Act No. 53, the

part of the first part. And in consideration of the sum of one dollar \$1.00, lawful money of the United States of America, so it well and truly paid by the said party of the second part, at and before the enclosing and delivery hereof, receipt whereof is hereby acknowledged, has granted and conveyed, and by these presents does grant and convey unto the said party of the second part and to his successors and assigns forever, all those certain parcels of land situate in the Borough of Bristol, County of Bucks, and Commonwealth of Pennsylvania, consisting of two tracts more fully described in accordance with the survey thereof dated July 28, 1944, made by G. Howard Abard, Registered Pennsylvania Surveyor, as follows:

Tract No. 1. Beginning at a stone monument a CORNER of land now or late of the Dorrance Estate and land of the Borough of Bristol, said beginning point being also the beginning point of a parcel of land conveyed to the said Borough of Bristol by a deed from Otto Haas and Phoebe W., his wife, dated the sixteenth day of August, A. D. 1935, and recorded in the Office for the Recording of Deeds at Doylestown, Pennsylvania, in Deed Book No. 641, page 194 No.; thence extending from said beginning point along said lands now or late of the Dorrance Estate the four next following courses and distances, to wit, N. 50° 00' 30" W. 170.00 feet to a slate monument in the lane entrance to the lock house, S. 38° 58' 30" W. 160.00 feet to a slate stone monument, N. 55° 31' 30" W. 57 feet to a broken slate stone, N. 38° 58' 30", E. 137 feet to

point, a corner of the old canal; thence S. 80° 17' 17", E. 27.88 feet to a post on the northerly side of the canal; thence along the northerly side of Lock No. 1, S. 70° 44' 30", E. 144.40 feet to a slate stone monument; thence N. 51° 32' 30", E. 135.20 feet to a corner of the old Crist Mill; thence S. 34° 54', E. 57 feet to a stone monument; thence N. 61° 43', E. 21 feet to a stone monument; thence S. 45° 53' 30", E. 44.41 feet passing over a stone monument on the easterly side of Wood Street to an iron rod set for a corner of lot now or late of C. W. Winters; thence along the same, N. 41° 23' 30", E. 43.50 feet to a point; thence S. 53° 15' 00", E. 15.87 feet to a point; thence N. 44° 14' 30", E. 12.00 feet to a stone monument; thence S. 50° 43' 30", E. 368.00 feet to a pipe; thence N. 57° 07' 00", E. 29.71 feet to a point; thence S. 65° 23' 13", E. 11.25 feet to a point; thence N. 53° 19' 57", E. 56.40 feet to a stone monument in the southwesterly side of Mill Street; thence along the said southwesterly line of Mill Street, S. 40° 35' 13", E. 110.02 feet to a stone monument in the bulkhead along the westerly side of the Delaware River; thence down the Delaware River along the outer side of said bulkhead, the five next following courses and distances, to wit, S. 39° 22' 30", W. 63.59 feet to a point, S. 51° 44' 30", E. 74.00 feet to a point, S. 40° 53' 30", W. 114.77 feet to a point, N. 82° 09', W. 25.30 feet to a point, S. 34° 54' 30", W. 376.50 feet to the end of the bulkhead thence crossing the old canal entrance to the tide lock, S. 70° 44' 30", W. 64.63 feet to a stone monument set for a corner of lands of Horn and Lass Company; thence along the same, N. 32° 21' 30", E. 417.00 feet to a stone monument at an angle; thence along the same and land conveyed to the Borough of Philadelphia by the aforesaid deed, recorded in deed book N. 44, page 194, S. 57° 15' 30", E. 227.00 feet to the monument; the first mentioned

Containing 9.55 acres be the same more or less.

Tract No. 2. Beginning at a stone monument in the corner of the Bristol Borough Pumping Station property on the westerly bank of the canal; thence crossing the said canal, S. 64° 28', E. 97.50 feet to a spike in the towing path of the canal; thence S. 17° 13' 30", E. 138.00 feet to a post by the northerly side of the canal; thence crossing the canal, S. 60° 17', W. 57.86 feet to a point a corner of the old Lock House lot; thence along lands now or late of the Dorrance Estate, N. 73° 45' 30", W. 142.85 feet to an iron pipe in line of Bristol Borough Pumping Station property; thence along the same, N. 13° 17' 30", E. 141.30 feet to a stone monument; thence N. 42° 33' 30", E. 36.4 feet to a stone monument, the first mentioned point and place of beginning.

Containing 0.57 acre be the same more or less.

Being a part of the same premises which were acquired under the authority of the act, approved the twenty-first day of June, one thousand nine hundred thirty-nine (Pamphlet Laws 622), for State park purposes, by the Commonwealth as a gift from The Delaware Division Canal Co. of Penna. by deed, dated October 31, 1940, and recorded on January 21, 1941, in the Office for the Recording of Deeds etc. of Bucks County, in Deed Book No. 692, page 496, etc., said deed being now on file in the Office of the Secretary of Internal Affairs.

This grant and conveyance is made under and subject nevertheless to the provision that the above described two tracts of land shall be and remain subject to the condition and restriction contained in the Act of May 1, 1947, H. R. Act No. 23, which provides that the Borough of

Bristol shall perpetually maintain the said tract of land only for a park and parking facilities connected therewith.

TOGETHER WITH all and singular the tenements, hereditaments and appurtenances whatsoever thereunto belonging, or in anywise appertaining, and the reversions, remainders, rents, issues and profits thereof; and also all the estate, right, title, interest, property, claim and demand whatsoever, as well in law as in equity, of the said party of the first part, of, in, to or out of the same and every part and parcel thereof, with the appurtenances.

TO HAVE AND TO HOLD the premises, all and singular the above mentioned and described, subject nevertheless to the exceptions, conditions, reservations, and restrictions, if any, in former deeds and this present conveyance contained, with the appurtenances unto the said party of the second part, its successors and assigns forever.

IN WITNESS WHEREOF, the Secretary of the Department of Property and Supplies has set his hand and affixed the seal of his department for the Commonwealth of Pennsylvania, and acting for and on behalf of the Department of Property and Supplies, with the approval of the Governor, the day and year first above written.

APPENDIX II

BRISTOL BOROUGH MARINA AUTHORITY

ARTICLES OF INCORPORATION

ARTICLES OF INCORPORATION

COMMONWEALTH OF PENNSYLVANIA
SECRETARY OF THE COMMONWEALTH

In compliance with the requirements of the "Municipality Authorities Act of 1945", approved the 2nd day of May, A. D. 1945, P. L. 382, as amended, the undersigned, desiring that an Authority be organized, do hereby certify:

1. The name of the Authority is: Bristol Borough Marina Authority.

2. Said Authority is formed under and pursuant to the "Municipality Authorities Act of 1945", approved the 2nd day of May, A. D. 1945, P. L. 382, as amended.

3. No other Authority has been organized under said "Municipality Authorities Act of 1945" or under the Act of June 23, 1935, P. L. 463, by the incorporating municipality herein. The School District of Bristol Borough has, however, heretofore, under authority of the "Municipality Authorities Act of 1945" created an Authority known as, "Authority of the School District of Bristol Borough".

4. The name of the incorporating municipality herein is the Borough of Bristol, Bucks County, Pennsylvania. The names and addresses of the municipal authorities of Bristol Borough, the incorporating municipality, are as follows:

William Stroble, c/o Horace Pine, 261 Wood St., Bristol, Pa.

Raymond Banker, 240 Mulberry St., Bristol, Pa.

Anthony Angelaccio, 226 Penn St., Bristol, Pa.

James Doughlass, 601 Radcliffe St., Bristol, Pa.

Frank Scordia, 217 Washington St., Bristol, Pa.

Leonard Accardi, 313 Lorraine St., Bristol, Pa.
John Rodgers, 604 Bath St., Bristol, Pa.
Howard Sharp, 537 Linden St., Bristol, Pa.
Joseph Elmer, 592 Swain St., Bristol, Pa.
William McHugh, 644 Corson St., Bristol, Pa.
Steven Bruscia, 816 Jefferson Avenue, Bristol, Pa.
William Veitch, 703 Corson Street, Bristol, Pa.
Renzo Dirotti, 1021 Pond St., Bristol, Pa.
Daniel DiMidio, 1022 Wood St., Bristol, Pa.
William Pearson, 1229 Pond St., Bristol, Pa.
Alfred Cordisco, 2000 Wilson Avenue, Bristol, Pa.
Howard Boyd, 217 Taft Street, Bristol, Pa.

5. The names, addresses, and term of office of the first members of the Board of the Bristol Borough Marina Authority are as follows:

Joseph J. Andreotti, 438 Washington Street, Bristol, Pennsylvania, 4 year term commencing January 1, 1963.

James W. Egan, 6 Fillmore Street, Bristol, Pennsylvania, 3 year term commencing January 1, 1963.

Frank E. Mignoni, 719 Radcliffe Street, Bristol, Pennsylvania, 1 year term commencing January 1, 1963.

Joseph Murphy, 1002 Radcliffe Street, Bristol, Pennsylvania, 1 year term commencing January 1, 1963.

Sidney W. Popkin, 113 Pond Street, Bristol, Pennsylvania, 5 year term commencing January 1, 1963.

H. Wesley Spencer, 246 West Circle, Bristol, Pennsylvania, 2 year term commencing January 1, 1963.

C. E. Stoneback, Jr., 1409 Wilson Avenue, Bristol, Pennsylvania, 2 year term commencing January 1, 1963.

Duly signed and sealed this 15th day of June, 1962.

BRISTOL BOROUGH COUNCIL

By: _____
President

ATTEST:

Secretary

APPENDIX III

PENNSYLVANIA CAPITAL BUDGET ACT

FOR FISCAL YEAR 1969-1970

HOUSE AMENDED

PRIOR PRINTER'S NOS. 1562, 1762, 1768,
1788, 1845

Printer's No. 1914

THE GENERAL ASSEMBLY OF PENNSYLVANIA

SENATE BILL

No. **1304** Session of
1970

INTRODUCED BY R. D. FLEMING, STROUP, VAN SANT, KLINE, MURRAY AND
FRAME, MARCH 3, 1970

AS RE-REPORTED FROM COMMITTEE ON APPROPRIATIONS, HOUSE OF
REPRESENTATIVES, AS AMENDED, NOVEMBER 10, 1970

A SUPPLEMENT

1 To the act of November 25, 1969 (P.L. 310), entitled "An act
2 providing for the capital budget for the fiscal year
3 1969-1970," itemizing public improvement projects to be
4 acquired or constructed by the General State Authority,
5 together with their estimated financial costs.

6 The General Assembly of the Commonwealth of Pennsylvania

7 hereby enacts as follows:

8 Section 1. Short Title.--This act shall be known and may be
9 cited as the "Capital Budget Act for Fiscal Year 1969-1970,
10 Public Improvement Project Itemization Supplement--General State
11 Authority."

12 Section 2. Itemization and Authorization of
13 Projects.--Additional capital projects in the category of public
14 improvement projects to be acquired or constructed by the
15 General State Authority, its successors or assigns, and to be
16 financed by the incurring of debt, are hereby itemized, together
17 with their respective estimated financial costs and the total
18 additional amount authorized for public improvement projects, as

1 follows:

2	A. Total Project Authorization	\$440,119,025	<--
3		\$443,595,562	<--
4		\$442,047,860	

21	III. Department of Forests and Waters	29,304,050	<--
22		32,279,050	

(34) Marina, Delaware River, South of
Municipal Wharf at Mill Street, Bristol
Borough, Bucks County..... 375,000
(Base Construction Cost \$300,000)

Section 3. Allocation of Funds.--Whenever as determined by the General State Authority, the full estimated financial cost of any of the public improvement projects itemized in section 2 hereof is not necessary for the proper design, acquisition or construction of such project, the excess funds no longer required may be allocated by the General State Authority to increase the estimated cost of any one or more of the public improvement projects specifically itemized in a capital budget.

Section 4. Effective Date.--This act shall take effect immediately.

APPENDIX IV

MINUTES OF PUBLIC MEETINGS

MEMORANDUM

TO: Files

FROM: Direction Associates, Inc.

DATE: June 25, 1981

SUBJECT: Bristol Borough/Otter Creek Marina
Feasibility Study

The first public meeting for the Bristol Borough/Otter Creek Marina Feasibility Study was held at 7:30 p.m., June 25, 1981, at the Municipal Building. Just prior to the meeting a severe thunderstorm struck the Borough. The heavy downpour and severe lightning may have contributed to the poor attendance, as there were only four (4) people present at the meeting.

The presentation included an analysis of boating registration statistics in Bucks County, the location and number of marinas in the Upper Delaware River, and a review of the plan prepared by C.A. Chaney & Associates in 1963. In general, it was agreed that there is a demand for boat slips in this area and that the development of the Otter Creek Basin for this purpose would be a significant "boost" to the image and perhaps to the economy of the Borough. All persons present expressed the hope that a way could be found to develop a marina facility.

DIRECTION ASSOCIATES, INC.

MEMORANDUM

TO: Files

FROM: Direction Associates, Inc.

DATE: February 11, 1982

SUBJECT: Bristol Borough/Otter Creek Marina
Feasibility Study

The second public meeting for the Bristol Borough/Otter Creek Marina Feasibility Study was held at 7:30 p.m., February 11, 1982, at the Municipal Building. There were in excess of forty (40) people in attendance at this meeting, including members of Borough Council and members of the Bristol Borough Marina Authority.

The presentation included a slide presentation identifying the character of the land and the water area in and around the Otter Creek Basin, followed by a presentation of the alternative design schemes for the site, and a financial feasibility analysis of each scheme. The marina schemes were summarized by the statement that it would not be possible for the Borough to construct a marina without substantial grant assistance to underwrite the cost of the project. Because such grants are not readily available, it was further recommended that the Borough attempt to secure private developers who might be interested in such an undertaking. If this effort is unsuccessful, it is recommended that the Borough give consideration to another use of the site. This use would be the development of the area as an environmental center, preserving this area as a tidal wetlands.

During the presentation, it was explained that the Borough did not own all of the on-shore areas adjacent to the basin. Several members of the governing body expressed surprise over this fact. One Council member stated that a study of this site had been undertaken before and that to study this site again seemed repetitious. It was explained that the purpose of the study was to review past studies and determine if it is feasible to construct such a facility today.

DIRECTION ASSOCIATES, INC.

Memo To: Files
February 11, 1982
Page Two

One member of the audience requested information about the Marina Authority. It was stated that the Authority was formed in 1963 to attempt to get this project moving. However, when it was unsuccessful in doing so, the Authority stopped meeting and had not met in many years.

Another member of the audience expressed an interest in seeing the area cleaned up in the event a marina could not be developed. Yet another person expressed an interest in the wetlands/park concept.

A boat owner expressed displeasure with the fact that the construction of the marina facility was viewed as financially infeasible. This person was on the waiting list for the Neshaminy State Park Marina, and expressed displeasure with the condition of the other marinas in the area.

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