FINAL

REVISED NEW LONDON HURRICANE PROTECTION PROJECT

NEW LONDON, CONNECTICUT

PREPARED BY THE

NEW ENGLAND DIVISION

U.S. ARMY CORPS OF ENGINEERS

WALTHAM, MASSACHUSETTS

February 1976

On July 26, 1971 a Final Environmental Impact Statement on the original New London Hurricane Barrier project was filed with the Council on Environmental Quality. Since that time extensive revision and changes in the original project have necessitated preparation of a new Environmental Impact Statement. This Final constitutes the first step in the revised Environmental Impact Statement process.

SUMMARY SHEET

NEW LONDON HURRICANE PROTECTION PROJECT
NEW LONDON, CONNECTICUT

( ) Draft (X) Final Environmental Statement

Responsible Office: U.S. Army Engineer Division, New England,
424 Trapelo Road, Waltham, MA 02154
(617 894-2400)

1. Name of Action: (X) Administrative ( ) Legislative

2. Description of Action: The proposed action is to construct an earth berm and flood wall to provide hurricane protection to approximately 35 acres in the downtown area of New London behind Shaws Cove. Approximately 3,400 feet of berm will be constructed primarily along the shoreline. The elevation of the berm varies from 12.0 feet to 14.5 feet above mean sea level.

3. a. Environmental Impacts: The project would provide improved commercial and recreational facilities, improved housing conditions, added economic development for downtown New London, and increased use of Shaws Cove and Thames River. Completion of the Shaws Cove Urban Renewal Project depends on the erection of the hurricane barrier.

3. b. Adverse Environmental Effects: Increases in levels of noise, turbidity and traffic congestion will accompany a decrease in air quality during construction. Approximately 2,600 feet of shoreline will be committed for the project.

4. Alternatives: (1) flood proofing; (2) evacuation; (3) protection under the original plan; (4) alternate locations; and (5) no action.

5. Comments Requested:

Federal

Department of Housing and Urban Development
Environmental Protection Agency
Department of Commerce
Department of Health, Education and Welfare
Department of the Interior
Federal Energy Administration

State

Connecticut Archeological Survey, Inc.
Connecticut Board of Fisheries and Game

Connecticut Water Resources Commission
Connecticut Historical Commission
Connecticut Department of Public Health
Connecticut Department of Agriculture
Connecticut Department of Transportation
Connecticut Office of State Planning
Connecticut Department of Environmental Protection
Southeastern Connecticut Regional Planning Agency

City

Thomas Harrington, Mayor of New London
Board of Health, City of New London
Planning Board, City of New London
Development Coordinator, City of New London
Redevelopment Agency, City of New London
Harbor Improvement Commission, City of New London

Organizations

Sierra Club
Marine Resources Committee
Committee on the Atlantic Salmon Emergency
Connecticut Action Now, Inc.
Save the Wetlands Committee
Connecticut Conservation Association
Connecticut Association of Soil and Water
Connecticut Wildlife Fed., Inc.
Connecticut Audubon Society

5. Comments Received:

City of New London, Connecticut
Connecticut Department of Transportation
New London Connecticut Redevelopment Agency
Connecticut Historical Commission
Department of the Interior
Department of Housing and Urban Development
Department of Commerce
Environmental Protection Agency
Connecticut Archeological Survey, Inc.
U.S. Department of Health, Education and Welfare

6. Draft Statement sent to CEQ 30 July 1975.
Final Statement sent to CEQ _____.

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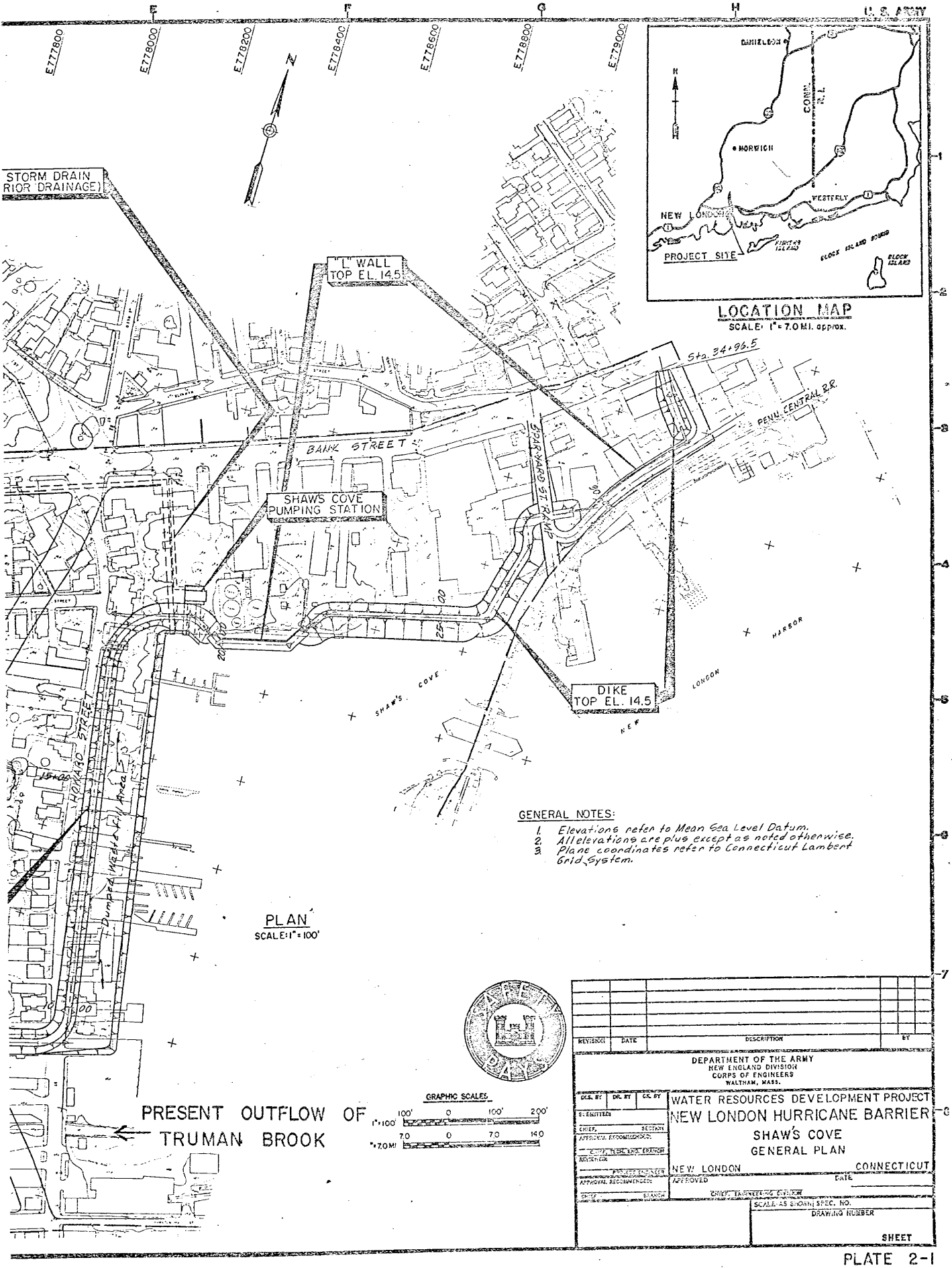
1.0 PROJECT DESCRIPTION

1.1 Detailed Description of the Project

The low areas behind Shaws Cove in New London, Connecticut have experienced problems with hurricane tidal flooding from the Thames River. The proposed project will provide flood protection to approximately 35 acres peripheral to the Central Business District of the City. The properties that will be protected include (1) the development planned by the New London Redevelopment Authority, (2) the existing property in the renewal area that will not be replaced during renewal, and (3) 18 acres of properties adjoining the project area. The project extends from high ground at Hamilton Street on the south end and terminates at high ground at Bank Street on the north end.

In general this alignment follows the shoreline rather closely but is modified as necessary to be compatible with the Shaws Cove Urban Renewal Plan, to avoid costly real estate and to provide access to real estate outside the project. The top elevation of the project from the south end to the City Coal Company at the north end of Shaws Cove will be at elevation 12.0 feet above mean sea level and from the City Coal Company to the north end will be at elevation 14.5 feet. The added elevation at the north end will provide protection against wave action for the portion that is directly exposed to the Thames River.

The major features of the project are an earth berm, "L" walls, pumping station and pressure conduit (See Plate 2.1). The latter two



GENERAL NOTES:

1. Elevations refer to Mean Sea Level Datum.
2. All elevations are plus except as noted otherwise.
3. Plane coordinates refer to Connecticut Lambert Grid System.

REVISION	DATE	DESCRIPTION	BY

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY | DR. BY | CK. BY

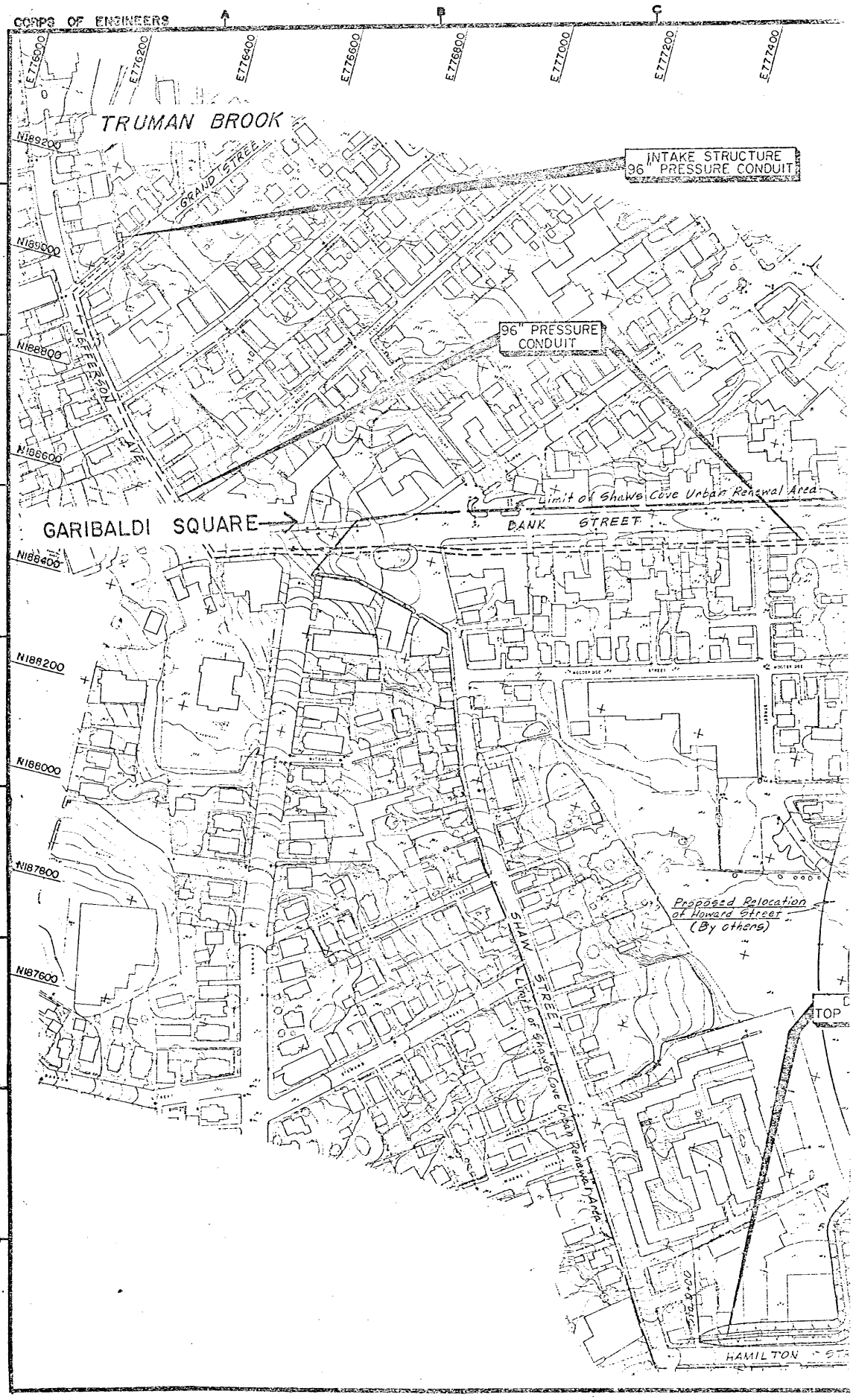
SUBMITTED
CHIEF, SECTION
APPROVAL RECOMMENDED
CHIEF, DESIGN BRANCH
REVIEWED
PROJECT ENGINEER
APPROVAL RECOMMENDED
CHIEF, BRANCH

WATER RESOURCES DEVELOPMENT PROJECT
NEW LONDON HURRICANE BARRIER
SHAW'S COVE
GENERAL PLAN
NEW LONDON CONNECTICUT

APPROVED DATE
CHIEF, ENGINEERING DIVISION

SCALE AS SHOWN | SPEC. NO.
DRAWING NUMBER
SHEET

PLATE 2-1


CORPS OF ENGINEERS
TRUMAN BROOK
INTAKE STRUCTURE
96" PRESSURE CONDUIT
96" PRESSURE CONDUIT
GRAND STREET
JEFFERSON AVE
GARIBALDI SQUARE
Limit of Shaws Cove Urban Renewal Area
BANK STREET
SHAW STREET
Limit of Shaws Cove Urban Renewal Area
Proposed Relocation of Howard Street (By others)
TOP
HAMILTON
E776000
E776200
E776400
E776600
E776800
E777000
E777200
E777400
N189200
N189000
N188800
N188600
N188400
N188200
N188000
N187800
N187600

features are essential to the relief of runoff when the water level exceeds the normal gravity outlet. The total protection is approximately 3,400 feet long.

The earth berm will be used from the south end to the oil tanks at City Coal Company. The earth berm starts again north of the City Coal Company dock and continues to a point about 40 feet beyond the existing Sparyard Street. A last short earth section extends west from the railroad tracks to the high ground on Bank Street at the north end of the barrier. The total linear distance of earth berm is approximately 2,800 feet. The berms will consist of an impervious core, a gravel bedding on the cove side and filter cloth and stone protection which will cover the entire berm. The 900 foot section on the west side of Shaws Cove will consist of the basic berm section plus a level area approximately 80 feet wide on the cove side of the berm. The rock necessary to build the low level rock berm is expected to be obtained from the installation of the pressure conduit. The area between the project berm and the cove low level rock berm will be filled with clean waste material obtained from the pressure conduit and other project excavations. The City eventually intends to complete the construction and convert the flat area into a parking lot and apply suitable gravel surfacing.

An "L" wall will be used to connect the earth berm ending 40 feet north of Sparyard Street to the berm that runs from the railroad tracks west to Bank Street. The total linear distance is approximately

300 feet. To furnish access to properties on the river side of the barrier, a ramp will be provided. Once over the barrier, traffic may proceed along the Access Road running parallel to the railroad and will cross the railroad at locations designated and provided by the City. A guard rail system will be provided along the railroad to contain traffic. To minimize the interference of the project with the Shaws Cove Urban Renewal Project, an "L" wall will be utilized in this segment.

The project will be completed in front of the City Coal Company dock by the use of circular steel cells and an "L" wall placed on the Shaws Cove side of the dock. The approximate linear distance is 300 feet. The structures will be located far away from the oil tanks to minimize the possibility of damage to the tanks. Locating the cells outside the limit of the existing bulkhead line will eliminate the need for excavating old foundations and driving sheeting through man-made fills. Circular cells are inherently stable; and therefore, a minimum of pile driving will be needed for these structures. The concrete cap over the cells at elevation 5.0 feet will serve as the base of the "L" wall as well as the replacement for the existing dock.

The pumping station will be situated behind the barrier at the north end of Shaws Cove. The station will be fed by a 72" storm drain. Under normal conditions water will flow by gravity through the station, under the berm and into the Cove. During flood conditions, appropriate sluice gates will be closed and the storm flows will be directed into the pumping station sump where it would be pumped over the berm. The designed pumping capacity is 225 cubic feet per second maximum.

Three pumps will provide the capacity.

A 96" diameter concrete conduit will carry water from Grand Street in southerly direction along side of Jefferson Avenue, then under the Shaws Cove Urban Renewal Project in an easterly direction and parallel with Bank Street, and finally in a southerly direction through the pump station on the westerly side of the berm.

The project is authorized by the Flood Control Act of 1962 (Public Law 87-874) dated October 23, 1962.

1.2 History of Project

The project design began in 1965 with initial construction funds authorized for FY 67. The City of New London was undertaking the development of a master highway plan and urban renewal plan from 1966 to 1968. The City therefore requested delays until their planning work could be completed.

The final design consisted of protection barriers for the Shaws Cove and Bentley's Creek area with appropriate navigation gates, street and railroad gates and a pumping station. The New London City Council gave assurance of local support in February, 1970 and the required local funds were made available in November 1970. Subsequently, strong public opposition to the expenditure of local funds arose. After review at the local level, the City Council requested the elimination of the Bentley's Creek protection and the relocation of the Shaws Cove dike so that the project followed the shoreline

behind Shaws Cove. The City also requested that the degree of flood protection be reduced to a 100 year storm frequency.

1.3 Current Status

Through consultation with the City of New London, a final design for the project has now emerged as described in Section 1.1.

The benefit cost ratio for the current plan is estimated at 1.3 to 1.

1.4 Relationships to Urban Renewal

The project has been designed to protect primarily the area that will undergo urban renewal. The urban renewal project can not be undertaken unless protection from hurricane tidal flooding is provided. The U.S. Department of Housing and Urban Development requires that there be adequate protection for the 100 year storm which is the design level of this project.

2.0 ENVIRONMENTAL SETTING WITHOUT THE PROJECT

2.1 Southeastern Connecticut Region

2.1.1 General Geography and Topography. The southeastern Connecticut region lies about halfway between Boston, Massachusetts and New York City. It is approximately 45 miles southeast of Hartford, Connecticut and 50 miles southwest of Providence, Rhode Island (Figure 1). The region is generally considered to comprise 18 towns in the southeast corner of the state (Figure 2). The area is bounded on the south by

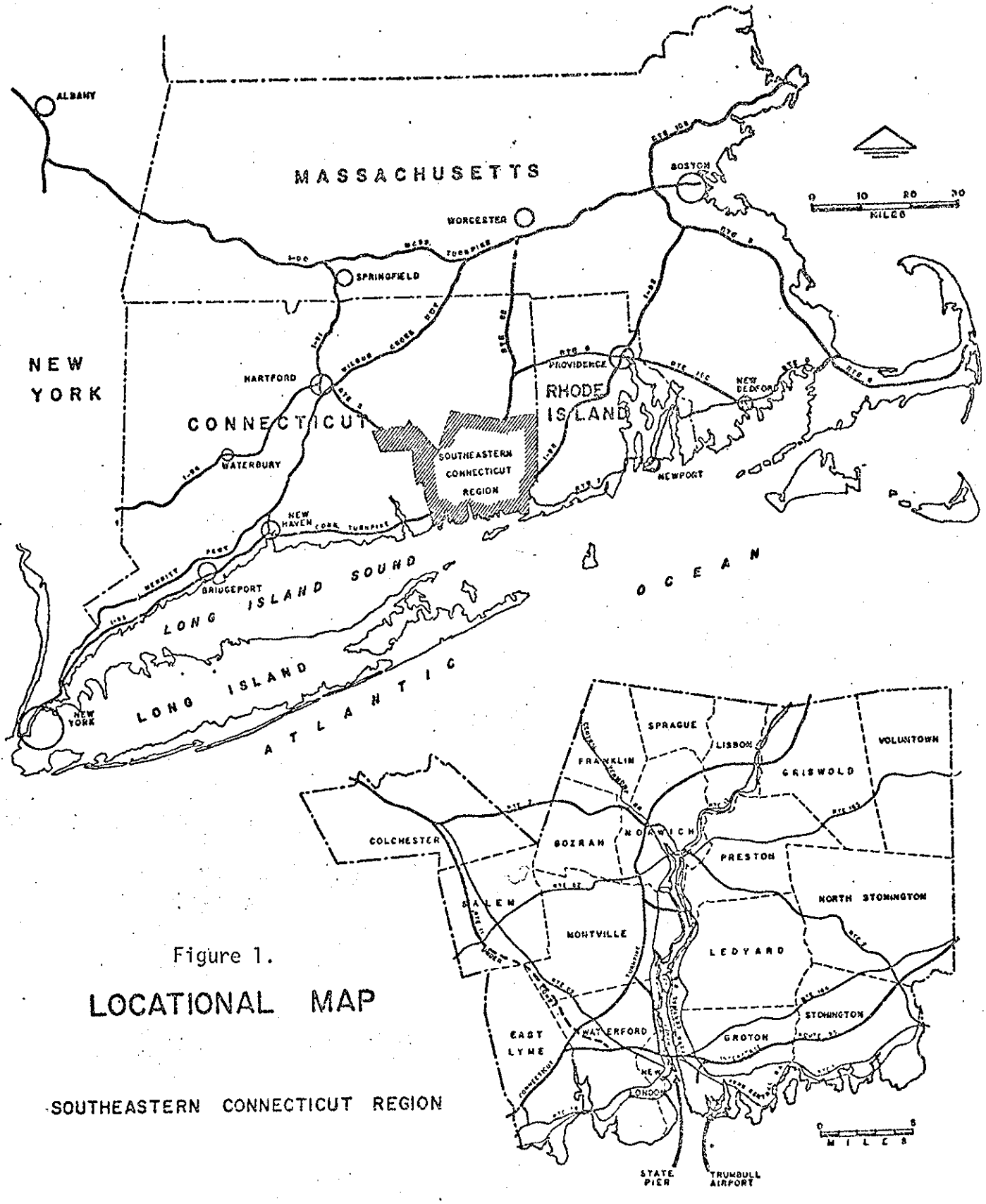


Figure 1.

LOCATIONAL MAP

SOUTHEASTERN CONNECTICUT REGION

PREPARED BY THE SCRPA STAFF - 1971

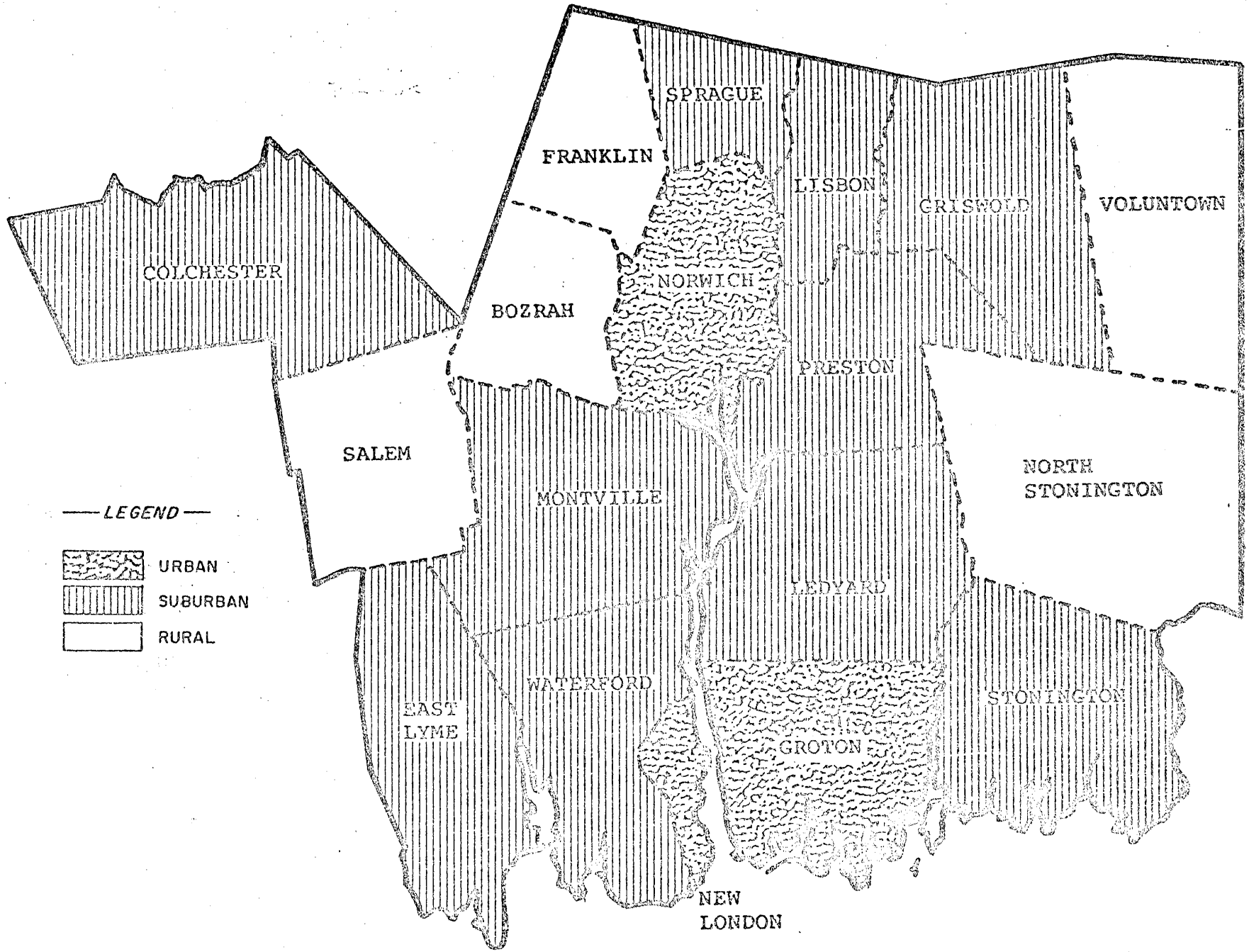


FIGURE 2. Town Location and Classification Map, 1970, Southeastern Connecticut Region.

Long Island Sound and by the State of Rhode Island on the eastern side. The dominant regional natural feature in the rolling countryside is the Thames River and its tributaries.

Five of the 18 towns are classified as rural (less than 100 persons per square mile) while 10 are classified as suburban (over 100 but less than 1000 persons per square mile). Three towns - Norwich at the head of the Thames, and New London and Groton on either side of the mouth of the Thames - are classified as urban with more than 1000 persons per square mile (Southeastern Connecticut Regional Planning Agency, SCRPA, 1972). The region has good transportation facilities. There are major highways and railroads in both the north-south and east-west directions.

2.1.2 Demographic Factors. The region now contains 7% of the State of Connecticut's population. The region's population in 1970 was approximately 220,000, up from 179,000 in 1960. Much of the growth over the past decade has occurred in the suburban towns. About 50% of the population now resides in the three urban centers, Norwich, Groton and New London, while 45% resides in the ten suburban towns. In 1960 the figures were 57% and 39% respectively. While Norwich and Groton continued to grow modestly in the last decade, New London lost about 7% of its population (SCRPA, 1972).

The region's population density is 394 persons per square mile, which is substantially less than the average of 605 for the State of Connecticut. Much of the population is concentrated along the Long Island shoreline and the Thames estuary. The maximum concentration, 5700 persons per square mile, is found in New London (SCRPA, 1972).

The Southeastern Regional Planning Agency has projected a population increase of 25% for the region in the decade of the 1970's. However, New London is expected to grow by only about 5%.

2.1.3 Land Use and Regional Resources. The Southeastern Connecticut Region contains 11.7% of the land area of Connecticut. As of 1970, the greatest land-use for the area was the undeveloped category.

General Classification	Area Square Miles	Area Percent of Total
Developed Land (Residential, Industrial Utilities & Transportation Corridors, Institutional, and Commercial Uses)	79.9	14.3%
Agriculture	38.8	6.9%
Open Space (Cemeteries, State Forests and Reservations)	67.9	12.1%
Undeveloped (Vacant land such as Forests and Wetlands)	372.6	66.7%
TOTAL	559.2	100.0%

Of the 79.9 square miles of developed land, about half is residential. The extensive industrial uses are primarily sand and gravel

pits in the suburban and rural areas, while the intensive industrial uses are manufacturing and fabrication in the urban areas. Transportation, communications and utilities account for 50% of the total developed land. Of the major category of Open Space, 14.0 square miles are utilized for active recreation and 13.8 square miles are used for reservoir areas (SCRPA, 1972).

The southeastern Connecticut terrain is a result of the continental glaciation and minor modifications by erosion and deposition processes. The valleys, rivers and streams run north-south. The bedrock is granite-gneiss while the overburden is glacial till. The predominant soils are stony to very stony sandy loams which are low in silt and clay. They are moderately well drained. Glacially deposited sand and gravel areas provide surface recharge for the aquifers in the region. The region is characterized by inland wetlands surrounded by high, dry hillsides (Department of Transportation, United States Coast Guard Academy, (USCGA, 1975).

The New London area has a temperate and changeable climate characteristic of its latitude and of New England. Owing to the moderating influence of Long Island Sound and the Atlantic Ocean, and particularly to the variable movements of high and low pressure systems approaching from the west or southwest, extremes of either hot or cold weather are rarely of long duration. In the winter, coastal storms frequently bring rainfall, in contrast to snow in the more northerly areas of Connecticut. The prevailing winds are from the northwest in the winter and the southwest in the summer. High winds,

heavy rainfall and abnormally high tides occur with unpredictable frequency. Hurricanes can be expected, especially during August, September and October.

The average annual temperature in the New London area is about 49°F, based on 18 years of record at Westbrook, Connecticut. January, the coldest month, has a mean temperature of 28.7°F. July, the warmest month, has a mean temperature of 70°F. Temperature extremes for the New London area are -21°F and 100°F.

The average annual precipitation in the New London area is about 47 inches. This data is based on 19 years of records from across the Thames River at Groton, Connecticut. The precipitation is fairly evenly distributed throughout the year. Average monthly rainfall varies between 2.53 inches in June and 4.95 inches in November. Extremes of monthly precipitation were 0.03 inches in June and 12.63 inches in August. This August figure reflects the occasional influence of hurricane rainfall on the area. Snowfall occurs from November to April and averages about 25 inches per year.

Hurricanes are generally accompanied by heavy rainfall, as shown on Table 1 which lists rainfalls associated with recent hurricanes. The heaviest one-day rainfall experienced at Groton was 7.4 inches in the September 1961 hurricane, "Esther."

The storm of record in New London was the hurricane of September, 1938. This was a 60-year event with a tidal surge of 9.7 feet above mean sea level. A 60-year event is one which can be expected to occur with an average frequency of once in 60 years.

TABLE 1

HURRICANE AND OTHER STORM RAINFALL

VICINITY OF NEW LONDON, CONNECTICUT
(Accumulated Rainfall in Inches)

Hurricane or Other Storm	New London, Conn.		Groton, Conn.		Westbrook, Conn.		New Haven, Conn.	
	24-Hour Maximum	Total	24-Hour Maximum	Total	24-Hour Maximum	Total	24-Hour Maximum	Total
Sept. 1938	-	-	-	-	-	-	6.4	11.0
Sept. 1944	3.4	7.1	-	-	2.8	6.2	4.0	8.5
Aug. 1954 (Carol)	4.5	5.0	3.4	3.5	4.4	4.4	2.8	2.8
Sept. 1954 (Edna)	4.0	5.3	6.2	6.2	5.6	5.6	5.6	5.6
Aug. 1955 (Connie)	2.0	4.0	5.1	5.6	4.3	7.3	3.2	3.6
Aug. 1955 (Diane)	1.8	1.8	1.2	2.3	1.4	2.2	3.2	4.3
Oct. 1955	-	-	2.3	4.3	-	5.1	3.8	5.9
Sept. 1960 (Donna)	-	-	3.2	3.8	3.8	4.3	5.3	5.5
Sept. 1961 (Esther)	-	-	7.4	7.6	2.9	3.0	2.0	2.0

The second largest storm, hurricane "Carol" of August 1954, produced a tidal surge of 8.9 feet above msl. This storm was approximately a 40-year event. It caused an estimated $3,000,000 worth of damages to the Shaws Cove area. A similar or more powerful storm today would, of course, produce much more extensive damage.

To determine the 100-year flood tide level, observations from the 1938 and 1954 hurricanes were combined with the record of the National Ocean Survey recording tide gage located at State Pier, New London Harbor from July 1938 to December 1969. This data was referenced to the 155-year period, 1815-1969 and a composite curve was drawn between the plotting positions for the two periods of record. The resulting 100-year tide level is 10.5 feet above mean sea level datum.

The natural environment of the southeastern Connecticut is dominated by the northern deciduous hardwood biome which is characteristic of the northeastern United States. The oak-yellow poplar association is predominant in the region. Between 50-75% of the land area is covered by forests. Hardwoods comprise about three fourths of the growing stock while softwoods account for one quarter (Kingsley, In Press).

The region's aquatic resources are dominated by the Thames estuary which extends northward about 16 miles from Long Island Sound to the confluence of the Shetucket and Yantic Rivers at Norwich. The Thames varies in width from 1.5 miles at New London Harbor to 400-500 feet at Norwich. The river system drains 1,473 square miles of eastern Connecticut, south central Massachusetts and western Rhode Island.

The mean tide range is 2.6 feet at Norwich and 3.1 feet at New London. Currents generally run 1/2 to 3/4 knots. During periods of low freshwater runoff, the salt water can extend almost two miles up the Shetucket River and one mile up the Yantic River. During heavy freshwater runoff, the penetration of salt water ceases at the Norwich tidal basin (USCGA, 1975).

Despite the apparent high levels of pollution in the Thames River, there are significant wildlife and fisheries resources. There is recreational fishing for winter flounder, white perch, American smelt, tomcod, bluefish and striped bass. There is also commercial fishing for American eel, American smelt, carp and for bait fish such as mummichog. The river formerly supported anadromous fish such as the American shad, salmon and alewife. Although there are no wetlands along the Thames River, the open waters receive heavy waterfowl use during migration season (USCGA, 1975).

Shellfish beds are known to exist in the estuary, but the entire estuary is closed to shellfishing due to pollution. Some oysters and quahogs are harvested and transplanted to cleaner water prior to final harvesting.

On the basis of the Connecticut State Water Resources Commission Standards, the Thames River is currently rated as "SC". "SC" is defined as "suitable for fish, shellfish and wildlife habitat; suitable for recreational boating and industrial cooling, good aesthetic value". The Commission has adopted the "SB" classification as the goal for the waters of the estuary. It is defined as "suitable for bathing,

other recreational purposes, industrial cooling and shellfish harvesting for human consumption after depuration; excellent fish and wildlife habitat; good aesthetic value" (State of Connecticut, 1974).

2.1.4 Economic Base. The Southeastern Connecticut region had approximately 73,000 civilian jobs available in 1970. Manufacturing jobs were about 28,600 or about 38% of the employment. Manufacturing has declined in relative importance in the job market in the last several decades. The textile and machinery industries' employment showed the largest decline since 1947. The transportation equipment industry (which is essentially the Electric Boat Division of General Dynamics in Groton) has shown the greatest growth since 1947 (SCRPA, 1973). Manufacturing employment by Standard Industrial Classification for 1973 is shown below for the major categories.

SIC Number	Name	Employment
22	Textile Mill Products	1391
23	Apparel	1183
26	Paper and Allied Products	1638
27	Printing and Publishing	1189
30	Rubber and Plastics	N/A
31	Leather and Leather Products	251
33	Primary Metals	1353
34	Fabricated Metal Products	2184
35	Machinery, except electrical	997
36	Electrical Equipment	629
37	Transportation Equipment	N/A
39	Miscellaneous	110
40	Transportation & Public Utilities	3522

The employment in the chemical and transportation equipment categories is not shown because it would divulge individual employment figures (U. S. Department of Commerce, 1973).

The retail employment in the region was approximately 11,000 in 1972. It is increasingly concentrated in the urban areas. There is some poultry and dairy farming in the region. About 850 people were employed in agriculture in 1972. The military has approximately 15,000 employees stationed at the Navy Base and the U.S. Coast Guard Academy. This is in addition to the 73,000 civilian jobs. Approximately one third of the total civilian and government employment in 1973 was associated with the defense industry.

The Southeastern Connecticut Regional Planning Agency has estimated that 39% of the total regional population is dependent on defense. This includes military personnel, civilian employees of military bases, employees of the Electric Boat Division of General Dynamics, and their dependents. The income derived from defense employment in 1973 was estimated at $330 million which was over 40% of the estimated $765 million of income for the region. The region's economy is highly dependent on the defense industry. The multiplier effect of the retail purchases of the defense employees increases further the importance of the defense sector to the economy of the region (SCRPA, 1973).

There is some tourism associated with the natural resources and historical attractions in the region. The main tourist attraction is Mystic Seaport Museum, which had over 500,000 visitors in 1972 (SCRPA, 1973).

The Thames River is an important asset to the economic base of the region. Several major manufacturing and oil companies use it for receipt and shipment of goods. The U.S. Navy Submarine Base at New

London has 17 piers. There are another 36 piers located on both sides of the river. In 1969, there were 3,891 inbound cargo and passenger vessels, and 792 tankers. Substantial growth in the vessel tonnage occurred after 1969 due to the increased handling of residual fuel oil (SCRPA, 1973).

The economy of Southeastern Connecticut is heavily dependent on the defense industry. The traditional textile industry has declined while the chemical industry has grown. Agriculture is a very minor source of employment. There is evidence of increased commercial use of the region's major natural resource, the Thames River.

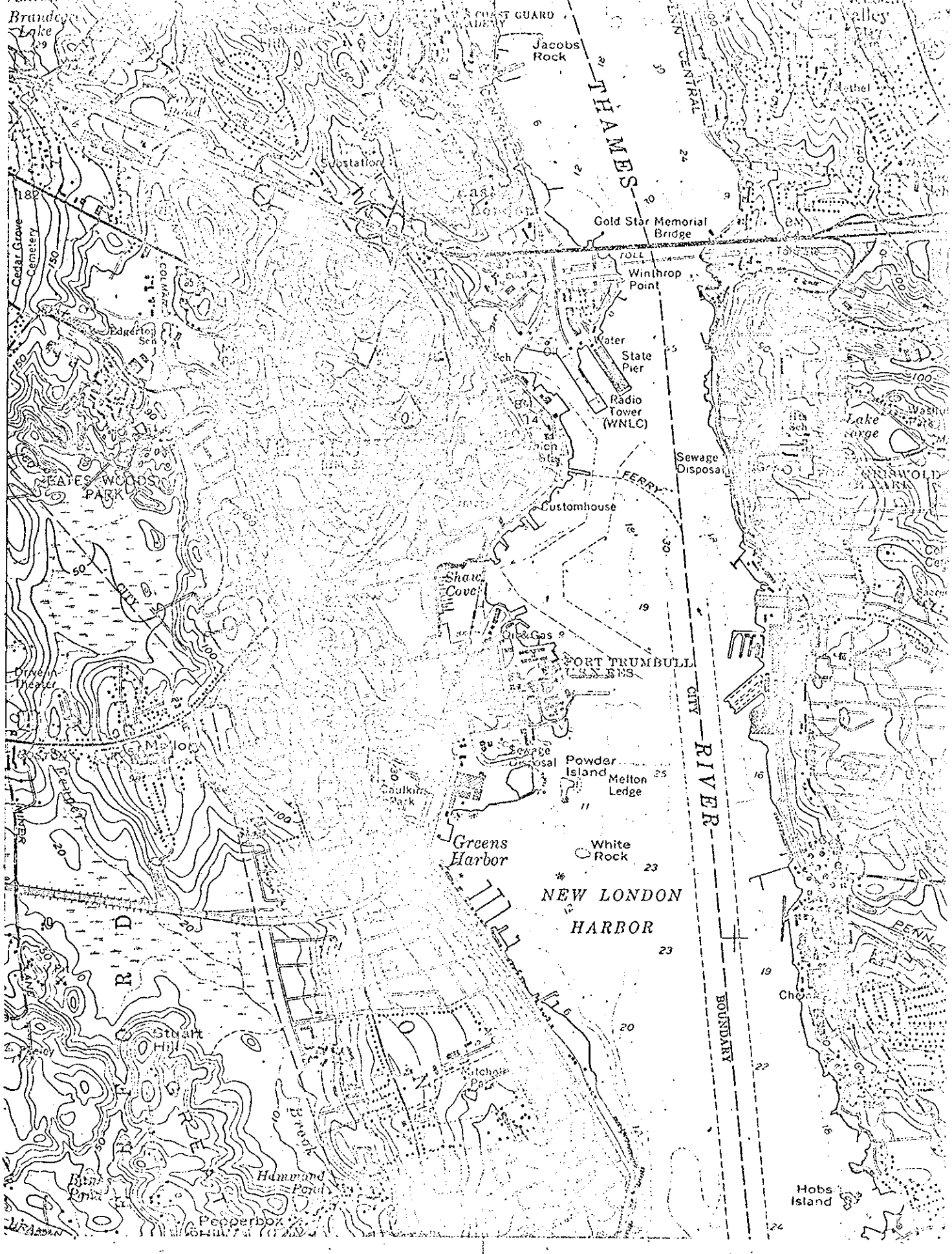
2.1.5. Air Quality. Air quality standards have been set by the State of Connecticut. There are no stations located in New London. Not all of the parameters are measured at all of the stations. Below are values obtained for stations near New London in 1973.

Place	NO_2 (ug/m^3)	Particulate (ug/m^3)
Groton	43.846	38.88
Old Saybrook	58.937	60.13
Voluntown	22.9607	30.75

These values are all within appropriate Connecticut State standards (USCGA, 1975).

2.2 New London

2.2.1 General Geography and Topography. The City of New London lies on the west bank of the Thames River at the entrance to Long Island Sound (See figure 3). It is bounded on the south by the Sound,


Brandegee Lake
Jacobs Rock
THAMES
RIVER
Gold Star Memorial Bridge
Winthrop Point
State Pier
Radio Tower (WNLC)
Sewage Disposal
FERRY
Customhouse
Cedar Grove Cemetery
EATES WOODS PARK
Shaw Cove
Gas
FORT TRUMBULL
Powder Island
Melton Ledge
Greens Harbor
White Rock
NEW LONDON HARBOR
CITY BOUNDARY
Stuart Hill
Hammond Pond
Pepperbox Hill
Hobs Island
Lake Forge

on the east by the Thames River, on the north and west by the Town of Waterford. It has an area of 6.2 miles and a total waterfrontage of 5.5 miles. Elevations range from sea level to +200 feet on the west side and north ends of the city. Within the city limits there are 230 acres of park and recreational land. Water supplies come from facilities located in towns north of New London.

New London Harbor is considered to be the first few miles of the Thames River. It is bounded by Groton on the east side and New London on the west. Fishers Island lies to the southeast and provides additional protection to the harbor from southerly storms. The harbor is used extensively by U.S. Navy and Coast Guard vessels. Along the southern end of the City of New London there are several beaches used for recreation. Following the shoreline northward on the west side of the harbor, there are several coves, the most southerly of which is Greens Harbor. Although small boats use this harbor, it is open to southerly storms. Shaws Cove, the site of the project is the next cove upstream. It is an almost landlocked cove with a controlling depth of 15 feet. The narrow entrance is crossed by a moveable railroad bridge. It is an excellent small boat harbor with protection from all directions. Further north is Winthrop Cove, a long narrow inlet used primarily for industrial purposes.

New London is located at the intersection of the inverted "T" that defines the population density of the region. New London is well connected by good roads to the other towns in the region. Its geographical location and connections to other areas are important assets.

However, the lack of major arteries within the city makes travel difficult within the city, especially in the downtown area.

2.2.2 Demographic Factors. New London was the only town in the southeastern region of Connecticut to experience a decline in population between 1960 and 1970. Study of the population changes in the region for the period shows that the migration to the suburbs was a major cause of the decline. The black population increased substantially during the period. Forty-eight percent of the blacks that live in southeastern Connecticut live in New London. Over 80% of the non-white population of New London is black (SCRPA, 1970).

2.2.3 Land Use and Natural Resources. Current land use within the municipal boundaries is primarily high density residential with high density mixed urban concentrations and intensive institutional uses as the next largest categories. Almost all of the land within the municipal boundaries has been developed. Only areas with excessive slope, poor drainage or shallow bedrock have been left without development. This condition has existed since the 1950's. Further development of New London will depend on more intensive use of the developed land. This intensive use will be dependent on the clearing away of blighted industrial and residential areas. These areas are concentrated around the Central Business District and the project area (James P. Purcell Associates, 1967).

New London has approximately 230 acres of recreational parks in addition to the land available at schools. These range from size of .1 acres to 75 acres. Two of the larger recreational facilities front on the waters of the Thames River and Long Island Sound (City of New

London, 1970). The major natural resource for New London is its long waterfront. Swimming areas are available. The Shaws Cove area is not being used for swimming. There is a marina currently located in the cove. There are eleven properties located in New London that are listed in the National Register of Historic Places. These are the Deshon-Allyn House, Fort Trumbull, Nathaniel Hempsted House, Joshua Hempsted House, Monte Cristo Cottage, New London County Courthouse, New London Custom House, New London Public Library, New London Railroad Station, Shaw Mansion and Whale Oil Row.

2.2.4 Economic Base. New London's economic base has changed over the years. Domination by the whaling industry gave way to the growth of the textile industry in the late 19th century. The textile industry declined during the first half of the twentieth century. It has been replaced by the defense industry and services employment. There were 24 industrial firms in the city in 1970. The largest employer had approximately 600 employees in 1970. Three firms employed about 100 each while the rest were substantially smaller. The largest employer is the U.S Navy Underwater Sound Lab owned by the U.S. Government with approximately 1200 employees, (City of New London, 1970).

There are substantial employment opportunities outside the city limits, especially in Groton across the river. A breakdown of the manufacturing employment in the New London labor market (East Lyme, Groton, Ledyard, Lyme, Montville, New London, Stonington, North Stonington, Old Lyme, Salem, Waterford) in 1972 was as follows:

Industry	Employees
Textiles and Apparel	1,040
Paper	480
Chemicals	2,820
Fabricated Metals	1,285
Machinery	1,126
Transportation Equipment	14,850
Other Manufacturing	1,925

Source: SCRPA, 1974

The median income for New London residents was $9,600 in 1969, which was the third lowest community in the region. The New London, Groton Norwich Standard Metropolitan Statistical area has the lowest median income of any area in the State of Connecticut (SCRPA, 1970).

In recent years there has been a definite shift in retailing patterns from the downtown commercial district of New London to the outlying communities. New shopping centers have complemented the more rapid population growth found in the adjacent towns. The lack of developed land in New London, the blighted condition of many of the commercial buildings and the downtown access difficulties have combined to inhibit the commercial growth within the city boundaries. Approximately 50% of the land within the city is tax exempt (City of New London, 1970). The extensive military holdings are in this category but do provide extensive employment opportunities.

Many of the residential and non-residential buildings in the central area of the town have been classified as deteriorating or dilapidated. In particular almost all structures in the project area fit this description (James P. Purcell and Associates, 1967). Many have already been destroyed to prepare the area for the planned urban renewal project.

2.3 Project Area

2.3.1 General Geography and Topography. The project site is at Shaws Cove, the almost landlocked cove just south of the Central Business District of New London. It is an urban setting. The project will protect about 35 acres of low land now subject to periodical tidal flooding.

Shaws Cove used to extend further inland on the southwest corner where Truman Brook currently empties into the cove. However, the low area around Truman Brook was subjected to landfill operations after the 1938 hurricane. The current shoreline in the southwest corner is a result of that operation (Cahn Engineers, Inc., 1974). Truman Brook now flows through culverting from Garibaldi Square at the other end of the urban renewal project.

The proposed project follows the shoreline leaving the railroad tracks outside along their full length. Shaws Cove itself and the spit of land that forms it on the east side will be outside of the protected area. The land in the southwest corner of the cove containing several businesses will also be outside of the berm. The site of

the project currently has existing commercial buildings in some places. These have been slated for demolition under the Shaws Cove Urban Renewal Project. The land behind the earth berm will be graded up gradually to within several feet of the top of the berm.

2.3.2 Demographic Factors. The area to be protected by the project is a mixed residential, commercial and industrial area. The Shaws Cove area has had the city's heaviest concentration of minority groups. Approximately one third of the area's residents are black or Spanish-speaking. Another one third of the population is elderly, retired, poor white people. The residents are generally unskilled. They are employed in the immediate area or unemployed.

Along the site of the hurricane protection project, and in the urban renewal area, almost all residences have already been removed to make way for the renewal project. The New London Redevelopment Authority has relocated the families and individuals.

2.3.3 Land Use and Natural Resources. The shoreline adjacent to the project is currently used for railroad tracks, commercial boat service operations, marina, distribution and transportation facilities, junk yards, lumber yard, and tank storage operations. The berm will eliminate some of the distribution and transportation facilities and part of a junk yard. It will cause a rearrangement of the water shore interface at the tank storage operation and will permit the development of a new and more extensive marina replacing the old one.

The natural resources of this urbanized area are Truman Brook and Shaws Cove. Truman Brook is very turbid and has often been

subjected to pollutants from runoff in the upstream urbanized area. Shaws Cove is classified as "SC" with the intent to reach an "SB" category. It is not currently used for swimming; consequently the New London Department of Public Health does not take water quality samples in the Cove. Although the entrance is narrow, the channel is 15 feet deep. The tide cycle provides regular flushing of the cove.

2.3.4 Economic Base. The project itself will require the permanent removal of several businesses, all of which are small. All of these are slated for replacement by the urban renewal project. The project will protect a number of existing businesses and residences along Bank Street and the Garibaldi Square area besides the urban renewal project area.

2.3.5 Historical and Archeological Features. The project construction will not affect any historical resources listed in or eligible for the Connecticut Statewide Inventory of Historic Resources or the National Register of Historic Places (Shannahan, 1975 and National Register, 1975). The project will protect the Shaw Mansion at 11 Blinman Street from flooding damage. This site is listed in the National Register and the Connecticut Inventory.

3.0 RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS

3.1 Relationship to City Land Use Plans

The provision of flood protection for the Shaws Cove Urban Renewal plans is consistent with the current land use plans for New London. The urban renewal project is a city ordinance and is consistent with

the Comprehensive Development Plan of June 1967. This plan was revised by the Community Development Action Plan established in April of 1970. Over 50% of the new housing required under the plan was to be built under the Shaws Cove Urban Renewal Plan.

The Shaws Cove Urban Renewal Project is bounded by Hamilton Street on the south side, Bank Street on the north side, Shaw Street on the west side, and the Thames River on the east side. Within these boundaries there are certain parcels of land that will not be acquired. These consist of several commercial establishments, a housing project and a mission. The total renewal area is approximately 70 acres. Shaws Cove comprises about 20 acres of the total area.

The objectives of the urban renewal are stated as follows in the Urban Renewal Plan, Shaws Cove Urban Renewal Project, Project No. Conn. R-126, New London Redevelopment Agency (NLRA), January 31, 1973.

(a) The elimination of structurally substandard buildings and other deteriorated and obsolete structures, and elimination of blighting influences and environmental deficiencies.

(b) The retention and/or rehabilitation of structures which are compatible with the long term plans for the area and which meet or can be feasibly restored to the standards established by this Plan.

(c) The provision of land for necessary public facilities and utilities, the prevention of flooding and removal of other impediments to land disposition and development; creation of a marine/commercial/residential development which takes advantage of the project area's unique waterfront location.

(d) The overall improvement of traffic circulation through the elimination of unnecessary streets, improving access to and egress from the project area, and widening existing streets wherever required.

To implement these objectives, the plan calls for the clearance of blighted buildings and areas of incompatible land use and environmental deficiencies. Much of this work has been completed. Those areas not to be acquired consist primarily of structures that are structurally sound and will be compatible with the overall land use plan. Some street relocations will be necessary.

The land use plan calls for four land use categories: residential, peripheral commercial, waterfront commercial and marina. Overall guidelines for development have been approved as well as specific requirements for each of the four land use categories. The residential category permits one-family and multi-family dwellings. Commercial use areas may contain service establishments and "light industry of a non-noxious character" (NLRA, 1973).

3.2 Relationship to Coastal Zone Management Plans

The State of Connecticut has begun planning under the Coastal Zone Management Act of 1972, P.L. 92-583. However, the coastal zone has not yet been defined nor has specific use planning begun.

4.0 THE PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT

The impacts expected from the project have been categorized according to the various phases of the project. The applicable activities for each phase have been reviewed and the potential impacts along with any mitigation or enhancement measures are detailed below.

4.1 Impacts During Construction Phase

The project will require the removing of some structures, the excavation and removing of silt deposits from in front of City Coal Company, the erection walls, the filling of a ramp at Sparyard Street and the filling of embankments. Also, the project will require a pumping station and pressure conduits (see Section 1.1).

4.1.1 Traffic. The construction activities will result in a temporary increase in traffic congestion in the project area. Although some of the embankment fill will come from excavation at the project area, other sources of fill will be necessary. Truck routing and the timing of these operations will be set to avoid hindering the normal operation of the downtown business area or the traffic flows to the navy installation at Trumbull Point. The Howard Street relocation will be accomplished by the Redevelopment Agency prior to the commencement of the building of the project.

4.1.2 Air Quality. The project area is located on the waterfront, and is subject to persistent coastal winds. Therefore, even though temporary increases in traffic and the increase in use of construction equipment may lower the air quality, the winds should quickly dissipate these pollutants. Part of the contractual obligations with the construction company will include the requirement that the construction vehicles be properly equipped with air pollution control devices as required by Federal, State and local regulations and that these devices be properly maintained.

Dust will result from the construction activities. Requirements for appropriate measures to suppress it will be included in the contract specifications for the project.

4.1.3 Noise. The trucking of fill material and the use of construction machinery will temporarily increase the noise levels. To minimize the effect of this, the operations will be restricted to appropriate times that will reduce interference with other activities in the area. The contractual obligations with the construction company will stipulate that noise control be consistent with the Federal, State and local standards.

4.1.4 Water Quality. The construction activities will result in minor disturbance of the bottom muds where the rock fill encroaches on the water on the north side of Shaws Cove and in front of the City Coal Docks where the mud will be removed prior to the placement of cells. The sinking of the cells will result in some temporary increase in turbidity as will the erosion of the embankment during construction. The tidal flushing will tend to dissipate particles that do not settle out rapidly. Because the increased turbidity will be short in duration, its effects on the biota of the cove will be minor. The current water quality of the cove is unfit for swimming according to the New London Health Department. Since the cove tends to be polluted, the temporary added stress on the system will have only minor effects. The material removed for the cell placement will be used by the

Redevelopment Agency as part of the fill for the parking area to be built on the west side of Shaw Cove.

4.1.5 Other. Approximately $1,485,000 of human labor and natural materials obtained from local sources will be committed to the construction of the project. There is potential for the spillage of gasoline or oil used in the construction machinery. The contract will require adherence to the appropriate procedures for control of such spills. The borrow areas for fill will be required to meet local standards for erosion and dust control.

4.2 Impacts during Operation and Maintenance Phase

4.2.1 Maintenance Operations. Maintenance operations will include the replacement of stones in the berm as necessary and regular maintenance of the three pumps. The consumption of labor and energy are the irretrievable impacts.

4.2.2 Operational Phase. When the water level in the cove exceeds the gravity flow outlet, the outlet will be closed by gates and the flow will be redirected to the pumps for discharge. The pumps will be run by a diesel engine. Potential impacts are the periodic consumption of energy during periods of high water and the possible fuel spills in handling of the diesel fuel.

4.3 Impacts of the Project Itself

4.3.1 Socio-economic. The Shaws Cove area has suffered the effect of urban blight. Substantial urban renewal is being planned for the area under Project No. CONN R-126 which was adopted by the New London

Redevelopment Agency and the City Council in February of 1973. Funding of the project by the U.S. Department of Housing and Urban Development is dependent on the provision of flood protection at the 100 year storm level. The proposed project will provide this protection.

The urban renewal project, made possible through the erection of the berm, will help provide New London with some needed assistance. Over half of the new housing requirements envisioned in the Community Development Action Plan are to be in the Shaws Cove area (City of New London, 1970). Because of extensive land use in New London, the City must rely on more intensive use of current land for its further development as a commercial and industrial center in the southeast Connecticut region. The tax benefits for the town of increased use of land close to the Central Business District are obvious. The improved waterfront development will allow New London to turn its waterfront in the Shaws Cove area into a valuable commercial and recreational asset. An expanded marina and more aesthetically pleasing surroundings will increase the recreational value of Shaws Cove and draw more boat users.

The protection project will not result in displacement of people. The project location has already been cleared of almost all structures except for a few commercial and industrial structures. The urban renewal project associated with the protection project has required the relocation of people

4.3.2 Local Hydrology. The 35 acres to be protected by the project have drained through Truman Brook, storm sewers and directly

into Shaws Cove and the Thames River. This runoff will be concentrated into one discharge in the northwest corner of Shaws Cove. The installation of the project will not change the amount of runoff and is not expected to change the concentration of pollutants.

4.3.3 Aesthetics. The visual impact of the hurricane barrier will be apparent from both the shore and water side of the structure.

From the land site, the berm will not protrude noticeably or obstruct the view of the Thames River. This is a result of several factors. The New London Redevelopment Authority will grade the urban renewal area up to within two or three feet of the top of the berm. The grade level at the west side of the north end of the cove is already at berm level or higher. The U.S. Army Corps of Engineers will require that the floor level of structures be at 10.5 feet above mean sea level for hurricane tidal protection. This will ensure a good view of the cove and river. The current major obstruction to the view of the Thames River from the west side of Shaws Cove is the railroad tracks and bridge that form the east side of the cove. The increased elevation of the activities on and behind the project in the "front row" will increase the scope of view of the river.

From the water side, the project will show variously as a wall or rock-armored earth berm. This will replace for the most part, the deteriorating and dilapidated structures that have lined the waterfront in this area. From the outside along Hamilton Street there will be a steep rise from about +6 to +12 feet in elevation above mean

sea level.

4.3.4 Historical Structures. According to the Connecticut State Historical Commission, there are no historic resources located in the project area that may qualify for inclusion in the Connecticut Statewide Inventory of Historic Resources (see letter of the Commission in Section 9.0). However, the project is expected to provide increased flood protection for the Shaw Mansion at 11 Blinman Street which is listed in the National Register of Historical Places.

4.3.5 Use of Resources. The project will commit the use of 2,600 feet of shoreline on Shaws Cove to tidal flood protection. Since the railroad remains outside the project, the shoreline along the Thames River north of Shaws Cove is not affected. The project also requires the commitment of materials, energy and labor.

5.0 ANY PROBABLE ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED

5.1 Water Quality

A temporary increase in turbidity in Shaw Cove during the construction phase, especially in the vicinity of the City Coal Company Dock is an unavoidable temporary adverse impact. Approximately 1/4 acre of the cove will be taken for the project.

5.2 Aesthetics

The creation of a berm along the Thames River and along Hamilton Street, south of Shaws Cove, will create a solid visual barrier (from outside the project) that had existed only partially prior to the project. The current view from the outside of the project includes

many deteriorated and dilapidated structures.

6.0 ALTERNATIVES TO THE PROPOSED ACTION

Four basic alternatives were considered for the project and some variations of the proposed alignment of the project.

6.1 Flood Proofing

This alternative consists of isolating individual buildings with walls, bricking up cellars or raising buildings. It generally has limited protection capability. Many of the buildings in the area have deteriorated to a point where their destruction was necessary under the urban renewal program. Protection of the individual buildings at 100 year storm level required by the U.S. Department of Housing and Urban Development (HUD) does not seem economical or practical.

6.2 Permanent Evacuation

This alternative consists of the removal of all inhabitants and buildings from the 35-acre area that would be protected by the proposed project. This alternative would force the abandonment of the urban renewal project. Approximately 18 acres of properties adjoining the urban renewal area would also have to be abandoned. These properties consist of commercial establishments and residences adjacent to the Central Business District. As indicated in Section 2.2.3 land useable for development is very scarce in New London. Further abandonment of taxable properties would aggravate the population decline and economic problems of New London.

6.3 Original Protection Plan

The original hurricane tidal protection plan for the City of New

New London was formulated in 1965. The scope of the project was considerably greater in that the plan provided protection for both the Shaws Cove and the Bentley's Creek segments of the City. The Shaws Cove segment consisted of a rock faced earth dike approximately 1,900 feet long running across the mouth of Shaws Cove in the Thames River extending from the Atlantic Oil Company property north of Smith Street on the south and terminating on the north at Bank Street. Within the dike a 45-foot navigation gated opening was provided to permit boats to pass through the barrier. The original protection plan was rejected by the City. The economic burden imposed by the plan appeared to be higher than the community wanted.

6.4 Alternative Alignments of Proposed Action

The selected alignment is the end product of economics, local acceptability and environmental considerations. Little flexibility existed in the alignment selection due to constrictions of the shoreline, the main line railroad tracks, the existing structures and the urban renewal development plans.

There were two areas of the project which permitted variation in the project alignment. In the vicinity of the City Coal Company an extensive investigation was made as to the structure and alignment most suitable to provide the necessary protection. Six variations of structures and alignment were considered, laid out and their costs estimated. Two of the alignments excluded the tank farm from the area being protected whereas four alignments provided protection for the oil tanks. The plan selected was considered to be the most desirable since it was found to be the least disruptive, a sound engineering solution,

least potentially damaging to the oil tanks, least risky and more aesthetically pleasing. The selected plan was acceptable to the City.

A second area with alternative solutions was on the Sparyard Street access to the railroad tracks and businesses outside the protection barrier. A street gate was considered. Current plans call for a ramp to replace the gate. This solution is less costly and easier to operate.

6.5 No Action

This alternative will result in the continued periodic flooding of the area. The economic deterioration of the area would probably continue since the flooding threat has probably been important in keeping business from expanding into the area. Under this alternative there will be no urban renewal program which is needed to help revitalize the downtown area of New London.

7.0 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The construction activity and its short-term impacts such as increased turbidity, increased air pollution, increased noise, and increased energy use are the prime short-term uses of the environment. These commitments are necessary in order to turn the flood prone area into a productive resource for the City of New London. New London needs land for development in order to maintain its socio-economic development. The Shaws Cove area is adjacent to the Central Business

District. It provides a logical extension for further development of the business district. The project will also permit the development of an expanded marina and a park area along the cove. This will increase the attractiveness and utilization of New London's prime natural resource, the Thames River. Improved water quality planned for the river and cove coupled with a managed shoreline will result in greater utilization of the resource by many interests.

8.0 ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

The irretrievable commitment of resources for this action consists of the labor, energy, materials, 1/4 acre of bottom of the cove and a strip of land consisting of 3-1/2 acres that will be used for the structure and pumping facilities.

9.0 COORDINATION

This project and its predecessor proposal have been coordinated during its development with the following agencies:

Public Health Service, U.S. Department of Health, Education and Welfare

Fish and Wildlife Service, U.S. Department of Interior

Bureau of Outdoor Recreation, U.S. Department of Interior

U.S. Environmental Protection Agency

U.S. Department of Housing and Urban Development

Board of Fisheries & Game, State of Connecticut

Connecticut Water Resources Commission

Connecticut Historical Commission

Southeastern Connecticut Regional Planning Agency

Board of Health, City of New London

Planning Board, City of New London

Development Coordinator, City of New London

Harbor Improvement Commission, City of New London

Redevelopment Agency, City of New London

Citizens: Robert Fromer, Alison Oldham

Copies of this Final are being sent to the following agencies for comment:

a. Federal

Department of Housing and Urban Development
Environmental Protection Agency
Department of Commerce
Department of Health, Education and Welfare
Department of the Interior

b. State

Connecticut Historical Commission
Connecticut Department of Transportation

c. City

Richard Martin, Mayor of New London
Redevelopment Agency, City of New London

d. Organizations

Connecticut Archeological Survey, Inc.

The attached letter shows the review statement of the Connecticut Historical Commission.

COMMENTS ON THE NEW LONDON HURRICANE PROTECTION PROJECT

9.1 The draft statement was issued on 30 July 1975 and sent to the agencies listed in Section 5 of the Summary. The 45 day review period for comments ended on 15 October 1975. Ten agencies responded with written comments. These agencies are listed in Section 5a. of the summary. The remainder of this section summarizes their comments and our responses to them.

a. Federal

(1) U.S. Department of Housing and Urban Development

Comment: We agree with the assessment in that the proposed action includes the necessary planning to minimize harm to the environment and we concur that the proposed project would not result in a foreseeable significant impact upon such quality.

Response: No comment.

(2) U.S. Department of the Interior

Comment: The single map of the project area (Plate 2-1) does not cover all of the area under discussion, and does not adequately locate it with respect to New London and the Thames River Estuary.

Response: Plate 2-1 indicates all of the area pertinent to the revised project. In addition, Figure 3 has been added to more clearly locate the project site.

Comment: The location map on Plate 2-1 is of too small a scale to be useful.

Response: The map is intended to locate the project site in relation to southeastern Connecticut. Figure 3 will show the area on a larger scale.

Comment: A number of areas and places mentioned in the text and of significance to the project are not found on Plate 2-1; among these are the areas flooded by the 100-year hurricane tide: Bentley's Creek area, Garibaldi Square, and the present outflow of Truman Brook.

Response: Bentley's Creek was to be protected under the original project. It is no longer relevant to the present, revised project. Plate 2-1 has been changed to indicate these other areas.

Comment: The stages for the 100-and 200-year hurricane tides and a brief explanation of their derivation should also be given.

Response: The text (page 13) has been changed to reflect these points. HUD guidelines, however, require 100-year flood tide protection for urban renewal areas. Two hundred year information is not relevant to the project and was therefore not included.

Comment: We find that no specific consideration has been given to archeological values.

Response: Dr. Frederic Warner of the Connecticut Archeological Survey, Inc., as designated by the Connecticut State Historic Preservation Officer, has reviewed the New London Hurricane Protection Project Draft EIS. He has stated that the land configurations which existed prior to the filling in of Shaw Cove would have made the cove a likely habitation site for early hunting-gathering groups. Dr. Warner has indicated that an intensive archeological survey should be conducted in the area that was once adjacent to Shaw Cove, now just east of Shaw Street. The area to which he refers stretches approximately 200 feet north and south of a point across from the intersection of Steward

and Shaw Streets. Since this area will not be directly affected by our project, but since it is still within the city urban renewal area, we have passed this information on to the Hartford Office of the U.S. Department of Housing and Urban Development. They have assured us that in their study of the environmental impacts of the Shaws Cove Urban Renewal Project full appreciation will be taken of all archeological and other cultural resources.

Comment: For the Corps assurance that its undertaking is not likely to encounter archeological values, or in order to best plan for their protection should values exist or be of high potential, we urgently recommend that the Corps consult with Dr. Douglas F. Jordan, University of Connecticut, State Archeological Museum, Storrs, Connecticut 06268.

Response: See response to previous comment.

Comment: It is unclear as to whether walkways and benches along the barrier are to be considered.

Response: Walkways and boltdown benches are being considered. Public access all along the barrier shall be permitted.

Comment: Unless there is 100% tidal flushing of the Cove with each cycle, turbidity may persist through construction of the project, due to the suspension of sediment being continually introduced into the water.

Response: With the exception of approximately 300 ft. of earth dike just inside the entrance to Shaws Cove, all dikes and "L" wall will be constructed on the upland. Thus, any increase of turbidity will be

of short duration. Those particles which do not settle out rapidly will tend to be dissipated by the tidal flushing although not necessarily within a single 12-1/2 hour tidal period.

(3) Environmental Protection Agency

Comment: On Page 7 of the statement, Section 1.4, Relationship to Urban Renewal, the statement reads: "the project is designed to protect primarily the area that will undergo urban renewal. The urban renewal project cannot be undertaken unless protection from hurricane tidal flooding is provided." It is our opinion that the impact of this project should include the impacts associated with the urban renewal project.

Response: We have been in contact with the regional HUD office. They have informed us that they will address the environmental impacts of the urban renewal project (see attached letter). Impacts can be expected to include but are not necessarily limited to; decreases in air quality during construction and possibly afterward due to increased traffic; increased sewage loads; relocation of some residents; more prosperity to the city and Shaws Cove area in particular; more local employment during construction and over the long term; and more aesthetically pleasing surroundings. See also the response to the Department of the Interior's fifth comment.

(4) United States Department of Commerce

Comment: Though the purpose of the project is to provide hurricane protection, there is no information included on the frequency and

intensity of tropical cyclones in the area. It is recommended that data be given on the coastal storms which cause the flooding which the project is intended to alleviate.

Response: Pages 13 and 14 of the impact statement have been revised to show this information.

Comment: On-site disposal of construction debris for use as a low-level rock berm and adjacent backfill, as well as the city's ultimate use of that area as a parking lot, does not justify the filling of 900 linear feet of intertidal and benthic habitat in an area that boasts "significant wildlife and fisheries resources."

Response: It is the Thames River estuary which supports significant fish and wildlife resources. Shaws Cove is polluted and as such supports lesser populations of fish and benthic organisms. Moreover, although a small amount of benthic habitat will be destroyed, fishery habitat will be enhanced due to the stony riprap to be placed along the dike. The area to be filled and later paved by the city for use as a parking lot east of the present Howard Street consists almost entirely of docks, boat storage, and support facilities. Less than 20% of the area is currently open water. Parking facilities are needed to prevent congestion once the urban renewal project is completed.

Comment: Justification for the placement of the "L" wall offshore of the City Coal Company property appears to rely entirely on cost rather than using a balanced assessment of the value of public access, as well as the financial benefits achievable or lost due to the identified alignment.