

# **GREAT AND LITTLE BAYS**

**THEIR TRIBUTARIES AND ADJOINING  
TRIBUTARIES OF THE PISCATAQUA RIVER**

## **NEW HAMPSHIRE AND MAINE**

**SURVEY  
(REVIEW OF REPORTS)**



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

**OCTOBER 1969**

## SYLLABUS

The Division Engineer has given detailed consideration to the requests made by local interests for improvement of navigation in the Great Bay area, New Hampshire and Maine. He finds that the area has potential for further development but use of the several waterways is hindered by inadequate access and lack of parking and launching areas for recreational boating. Greatly expanded use of the waterway can be anticipated when local interests make improvements to shore facilities. The Division Engineer further finds that modification of the several waterways through deepening and widening is not needed at this time. The several access channels desired by local interests are of purely local benefit and should be provided by local interests. No further improvement is warranted at this time by the Federal Government.

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DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02154

IN REPLY REFER TO

NEDED-R 15 October 1969  
SUBJECT: Survey (Review of Reports) on Great and Little Bays  
and Their Tributaries and Adjoining Tributaries of  
the Piscataqua River, New Hampshire and Maine

TO: Chief of Engineers  
ATTN: ENGCW-PD

AUTHORITY

1. This report is submitted in compliance with a resolution adopted 24 June 1965 by the Committee on Public Works of the House of Representatives, United States, which reads as follows:

"Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports of the Chief of Engineers on Great and Little Bays and their tributaries and adjoining tributaries of the Piscataqua River, New Hampshire and Maine, published as Senate Executive Document Numbered 44, Forty-eighth Congress, First Session, and other reports, with a view to determine the advisability of providing improvements in the interests of navigation and allied purposes."

and in response to an item in Section 304 of the River and Harbor Act of 1965, adopted 27 October 1965, which reads as follows:

"The Secretary of the Army is hereby authorized to cause surveys to be made at the following locations and subject to all applicable provisions of Section 110 of the River and Harbor Act of 1950: --- Great and Little Bays and their tributaries, New Hampshire, and adjoining tributaries of the Piscataqua River, New Hampshire and Maine, with a view to determining the advisability of providing improvements in the interest of navigation and allied purposes."

2. By letters dated 3 August 1965 and 9 November 1965, the Chief of Engineers assigned a study of survey scope to the Division Engineer, New England Division.

#### PURPOSE AND EXTENT OF STUDY

3. The purpose of this study is to determine the advisability of providing navigation improvements to the waterways within the study area.
4. A public hearing was held at Durham, New Hampshire, on 23 June 1966 to obtain the specific navigational improvements desired by local interests and their views. A digest of testimony and exhibits presented at the hearing are contained in Appendix A of this report.
5. The topography shown on the accompanying report maps was obtained from enlargements of U. S. Geological Survey Sheets and from the Coast and Geodetic Survey Chart No. 212, modified by additional data obtained from vertical aerial photography taken by the Corps of Engineers during May 1967. The hydrography on all maps was obtained from an enlargement of the boat-sheets of a survey by the U. S. Coast and Geodetic Survey made between April 1953 and September 1954.

#### DESCRIPTION

6. The study area, located in the southeasterly portion of New Hampshire bordering Maine, is about 50 miles southwest of Portland, Maine and 51 miles northeast of Boston, Massachusetts. It is shown on the United States Coast and Geodetic Survey Chart No. 212. About 92% of the water area included in the study is in New Hampshire while the remaining 8% is in Maine. That portion in New Hampshire lies within the Counties of Strafford and Rockingham, and includes the City of Dover, and the Towns of Rollinsford, Durham, Newmarket, Newfields, Exeter, Stratham, Greenland, and Newington. The portion in Maine lies within the County of York and includes the Towns of South Berwick and Eliot.

7. The water area considered in the study comprises the upper section of the Piscataqua River estuary. It includes Great and Little Bays, and the tidal portions of the Squamscott (Exeter), Lamprey, Oyster, Bellamy, Cocheco, and Salmons Falls Rivers. It also includes that section of the Piscataqua River lying upstream from the upper end of the Portsmouth Harbor and Piscataqua River Federal navigation project, located about 1/2 mile downstream from the inlet to Little Bay. The study area includes interconnected waterways having a total length of 37 miles and a water area, at mean high water, of about 8,815 acres (13.8 sq. miles) of which about 1965 acres (3.0 sq. miles) are contiguous water areas having depths, at mean low water, of at least 6 feet. Also included in the study area are about 100 miles of tidal shores and about 3,700 acres (5.8 sq. miles) of tidal flats. A breakdown of these physical features of the various waterways within this study area is shown in Table 1 below.

TABLE 1

PHYSICAL FEATURES OF WATERWAYS

Name of Waterway	Location-City or Town	Length Measured Along Existing Channel (Miles)	Water Contiguous Area at Water Areas		Tidal Flats <sup>(1)</sup> (Acres)
			MHW (Acres)	6' Deep (MLW) or More (Acres)	
Salmon Falls River	Rollinsford, Dover, So. Berwick	4.0	360	15	220 <sup>(2)</sup>
Cocheco R.	Dover	3.0	130	25	70
Piscataqua R.	Dover, Eliot & Newington	5.0	1,000	380	315
Bellamy R.	Dover	4.0	435	35	205
Oyster River	Durham	3.0	320	35	45
Lamprey R.	Newmarket	2.0	105	0	65
Squamscott (Exeter) R.	Exeter, Newfields, & Stratham	7.0	350	25	80
Great Bay (incl Crommet Cr. to highway bridge)	Newmarket, Durham, Newington, Green-land	4.0	4,225	430	2,275
Little Bay	Durham, Dover, Newington	5.0	1,890	1,020	475
<b>TOTALS</b>		<b>37.0</b>	<b>8,815</b> (13.8 sq. mi.)	<b>1,965</b> (3.0 sq. mi.)	<b>3,750</b> 5.8 sq. mi.

TABLE 1 (Cont'd)

(1) Definition - marshy or muddy land areas which are covered and uncovered by the rise and fall of the tide.

(2) Estimated

8. Tides in the area are semi-diurnal. Their mean ranges vary from about 6.0 feet to 7.0 feet. Currents within Great and Little Bays and their tributaries, except at the lower two bridges across the Squamscott River and at Little Bay in the vicinity of the General Sullivan Bridge, are moderate. The Piscataqua River is characterized by rapid currents with abrupt and hazardous cross currents. The maximum average velocity in the vicinity of the General Sullivan Bridge is in the order of 4 knots.

TRIBUTARY AREA

9. The immediate tributary area to Great and Little Bays comprises the eleven cities and towns, named in paragraph 6, which border the waters within the study area. The 1960 U. S. Census showed the population of these communities to be 49,232, an increase of 27% over the 1950 census. This growth was about double the population growth for the entire State of New Hampshire, and about 3 1/2 times greater than similar type growth in the whole State of Maine during the same period. The 1969 OBERS (Office of Business Economics and Economic Research Service) projections indicate that New Hampshire's population will more than double during the 1960 -2020 period, rising from 0.6 million to 1.25 million, while Maine's population will rise from 1.0 million to 1.7 million.

10. Industry, agriculture and recreation rank in that order to the area's economy. The area's recreational boating activities lags similar activities in other tidewater areas of New Hampshire and Maine. Practically every kind of salt water fishing is to be found in these waters, with Little and Great Bays having an outstanding potential for shellfishing.

11. The principal industries of the area are the manufacture of shoes, textiles and mica products. Dover and Exeter are shopping centers for their surrounding communities. Much of the economic activity in the region results from operations at the Portsmouth Naval Shipyard located in Kittery, about 5 miles from Great Bay, and at the Pease Air Force Base at Newington, adjacent to Great Bay. An estuarine laboratory is being constructed at Adams Point, bordering Great Bay, by the University of New Hampshire.

#### BRIDGES AFFECTING NAVIGATION

12. There is one railroad and four highway bridges crossing the waterways within the study area. Details of these bridges follow:

a. Eliot Bridge - a fixed-span highway (State Route 101) bridge, about 600 feet long, crossing the Salmon Falls River about 1 mile upstream from its confluence with the Cocheco and Piscataqua Rivers. It is located in the Towns of South Berwick, Maine and Dover, New Hampshire, and is owned jointly by the States of Maine and New Hampshire. It has a horizontal clearance of 36 feet and a vertical clearance of 5 feet at mean high water. It is reported that the bridge contained a drawspan which was changed to a fixed-span about 30 years ago.

b. General Sullivan Bridge - a twin high level fixed-span highway (U.S. Route 4) drawbridge, crossing the Little Bay Inlet near its confluence with the Piscataqua River. It is located in the Town of Newington and the City of Dover and is owned by the State of New Hampshire. It has a horizontal clearance of 200 feet and a vertical clearance of 33 feet at mean high water (46 feet for middle 100 ft. width).

c. Scammel Bridge - a bascule type highway (U.S. Route 4) drawbridge, crossing the Bellamy River near its outlet at Little Bay. It is located in the City of Dover and owned by the State of New Hampshire. It has a horizontal clearance of 40 feet and a vertical clearance, when closed, of 9 feet at mean high water. Bridge regulations require bridge openings, except in case of emergency, only between hours of 6:00 a. m. and 10:00 p. m., from April 1 to October 31, and subject to 4 hours advance notice to bridge owner or agency controlling the bridge.

d. Boston & Maine Railroad Bridge - a fixed-span railroad bridge (carrying freight traffic only), crossing the Squamscott (Exeter) River at its outlet at Great Bay. It is located in the Towns of Stratham and Newfields and is owned by the Boston & Maine Railroad. It has a horizontal clearance of 30 feet and a vertical clearance of 5 feet at mean high water. Previous to 1955 it contained a drawspan which was closed, with approval of the Corps of Engineers.

e. State Route 108 Highway Bridge - a fixed-span highway bridge crossing the Squamscott (Exeter) River about 1 1/2 miles upstream from its mouth at Great Bay. It is located in the Towns of Stratham and Newfields and is owned by the State of New Hampshire. It has a horizontal clearance of 50 feet and a vertical clearance of 9.5 feet. It was originally a drawbridge and was converted to a fixed-span bridge in 1955. The records at that time showed that there had been no navigation openings since 1950, when there were two.

f. State Route 101 Highway Bridge - a fixed-span highway bridge crossing the Squamscott (Exeter) River about 4 1/2 miles upstream from its mouth at Great Bay. It is located in the Towns of Stratham and Exeter and is owned by the State of New Hampshire. It has a horizontal clearance of 113 feet and a vertical clearance of 14 feet.

#### PRIOR REPORTS

13. There have been numerous previous reports on three of the tributaries of Great and Little Bays, namely, the Exeter (Squamscott), Lamprey, and Bellamy Rivers, and on that portion of the Piscataqua River within the study area, that is, upstream from a point about 1/2 mile southerly of the inlet to Little Bay, together with one of its tributaries, the Cocheco River. These are described in Table 2 below.

TABLE 2

Locality	Nature and Date of Report	Published In	Work Considered and Recommendations
Bellamy River, N. H.	Preliminary Examination and Survey, 1887	Annual Report (1887) of Chief of Engineers	Four mile channel 50 ft. wide and 5 ft. deep from river mouth to Sawyers Mill at Dover. Favorable.
Bellamy River,	Preliminary Examination 1926	H. Doc. No. 467, 69th Cong., 1st Session	Abandonment of project recommended. No action taken.
Cochecho River, N. H.	Survey 1870	Annual Report (1871) of Chief of Engineers H. Ex. Doc.No. 60, 41st Cong., 3d. Session	Channel one mile long between Dover and "Lower Narrows", 40 to 75 ft. wide and 4 ft. deep. Favorable.
Cochecho River, N. H.	Spec. Survey 1882	--	Cut-off channel at Alley's Point. Widen to 60 ft. and deepen to 5 ft. channel at Trickey's and Clement Point Shoals. Favorable.
Cochecho River, N. H.	Preliminary Examination and Survey 1889	Annual Report (1890) of Chief of Engineers H. Ex. Doc.No. 74, 51st Cong., 1st Session	Channel 60 to 75 ft. wide 7ft. deep (in rock 50 ft. wide and 7½ ft. deep) from river mouth to Dover (3 miles). Favorable
Cochecho River, N. H.	Preliminary Examination 1909 Survey 1910	H. Doc. No. 61st Cong., 3rd Session	Channel 60 to 100 ft. wide, 9 ft. deep from mouth to Dover. Unfavorable.

TABLE 2 (Cont'd)

Locality	Nature and Date of Report	Published In	Work Considered and Recommendations
Cocheco River, N. H.	Preliminary Examination 1926	H. Doc. No. 467, 69th Cong., 1st Session	Abandonment of project recommended. No action taken.
Exeter (Squamscott) River, N. H.	Survey 1874	Annual Report (1875) of Chief of Engineers and H. Ex. Doc. No. 75, 43d Cong., 2d Session	Channel 40 ft. wide, 6 ft. deep to Oxbow and 40 ft. wide, 4 ft. deep from Oxbow to Exeter. Favorable.
Exeter (Squamscott) River, N. H.	Survey 1897	Annual Report (1897) of Chief of Engineers H. Doc. No. 41, 55th Cong., 1st Session	Restore channel depths and widths to Oxbow, deepen channel to 5 ft. from Oxbow to Exeter, turning basin at upper end 200 by 110 ft. Favorable.
Exeter (Squamscott) River, N. H.	Preliminary Examination 1909 Survey 1910	H. Doc. No. 1090, 61st Cong., 3d Session	Straighten channel below Stratham Highway Bridge. Favorable.
Lamprey River, N. H.	Preliminary Examination and Survey 1874	H. Ex. Doc. No. 75, 43rd Cong. 2nd Session Annual Report (1875) Chief of Engineers	Channel from mouth to Lower Narrows 100 ft. wide, 6ft. deep, thence 40 ft. wide, 5 ft. deep to Newmarket, Favorable.
Lamprey River, N. H.	Preliminary Examination 1909, and Survey 1910	H. Doc. No. 1066, 61st Cong. 3d Session.	Remove boulders in channel, opposite wharfs. Unfavorable.

TABLE 2 (Cont'd)

Locality	Nature and Date of Report	Published In	Work Considered and Recommendations
Great Bay, N. H.	Preliminary Examination 1882 and Survey 1883	Annual Report (1884) of Chief of Engineers and Sen. Ex. Doc. No. 44, 48th Cong., 1st Session.	Construction of dam and lock near mouth of Great Bay to maintain high water level navi- gation above and de- crease strong currents in Piscataqua River and Portsmouth Harbor below. Favorable survey report, however, no Congressional action taken.
Portsmouth Hbr. N. H. and Maine	Preliminary Examination (Review of Reports) 1909	H. Doc. No. 1086, 61st Cong., 3d Session	Construction of lock and dam in Piscataqua River. Unfavorable.

## EXISTING CORPS OF ENGINEERS PROJECTS

14. There are four Federal navigation projects within the study area. They are:

a. Bellamy River - Adopted in 1888, located in Dover, New Hampshire, provides for a 4 mile long channel 50 ft. wide and 5 ft. deep, extending from Little Bay to Sawyers's Mill in Dover. Project completed in 1896.

b. Cochecho River - Adopted 1890, located in Dover, New Hampshire, provides for a 3 mile long channel 60 to 75 ft. wide and 7 ft. deep (in rock 50 ft. wide and 7  $\frac{1}{2}$  ft. deep), from confluence of Piscataqua River to Dover. Project completed in 1906.

c. Exeter-(Squamscott) River - Adopted 1899, located in Exeter, Newfields, and Stratham, New Hampshire, provides for a  $7\frac{1}{2}$  mile long channel, 6 ft. deep from Great Bay to the Oxbow, and 40 ft. wide and 5 feet deep from Oxbow to Exeter with a turning basin 200 by 110 ft. at Exeter. Project completion in 1911.

d. Lamprey River - Adopted 1881, located in Newmarket, New Hampshire, provides for a  $2\frac{1}{2}$  mile long channel, 100 ft. wide and 6 ft. deep from Great Bay to the Lower Narrows, then 40 ft. wide and 5 ft. deep to Newmarket. Project completed in 1883.

15. The above projects were constructed primarily to provide for commercial navigation, mainly barge transportation of coal between small industrial centers and Portsmouth Harbor. As there has been no commercial navigation on these projects for many years, none of them have been maintained since 1913.

#### LOCAL COOPERATION ON EXISTING PROJECTS

16. Local cooperation was not required on the four Federal navigation projects within the study area, namely, the Exeter (Squamscott), Lamprey, Bellamy and Cocheco River Projects.

#### OTHER IMPROVEMENTS

17. State and municipal governments have provided no improvements for the benefit of general commercial navigation. The state of New Hampshire and the towns of Stratham, Newmarket and Durham, however, have provided a few boat launching and docking facilities for recreational boating use. In addition, the state of Maine proposes to construct, within the next year, a boat ramp at Eliot along the Piscataqua River. It is expected that 50% of the cost of the work will be provided through a Federal grant-in-aid.

#### TERMINAL AND RECREATIONAL BOATING FACILITIES

18. There are no commercial terminal facilities within the study area. A number of publicly-owned (see paragraph 17) and privately-owned boat launching and berthing facilities are located within the area. Details of these facilities are shown in Table 3 on page 11 while their locations are shown on the "Vicinity Map" on Plate 1 of this report.

TABLE 3  
INVENTORY OF BOAT LAUNCHING & BERTHING FACILITIES <sup>(1)</sup>  
(Includes publicly and private owned facilities open to public)

No.	Name of Facility	LOCATION			Berthing Facilities			Launching Facilities			Off-street	Boat Fuel Available
					No. Boats		Boat Ramp	Ramp Surface	Marine R. W.	Incl. Trailer	No. Cars	
					In Slips	At Dock or Float						
1	Piscataqua River State Park (2)	Eliot, Me.	Piscataqua R.	State of Me.	0	0	Yes	Paved	No	25	No	
2	Magloras Marina	Dover, N. H.	Cocheco R.	Private	0	16	No	-	-	0	Yes	
3	Hilton State Park	Dover, N. H.	Piscataqua R.	State of N. H.	0	3	Yes	Paved	No	30	No	
4	Irv's Marina	Dover, N. H.	Little Bay	Private	30	2	Yes	Paved	No	25	Yes	
5	Great Bay Marina	Newington, N. H.	Little Bay	Private	70	4	Yes	Not Paved	Yes	35	Yes	
6	Jackson Town Landing	Durham, N.H.	Oyster R.	Town	0	1	Yes	Paved	No	20	No	
7	Durham Town Landing	Durham, N.H.	Oyster R.	Town	0	1	No	--	No	20	No	
8	Adams Point Landing	Durham, N.H.	Little Bay	State of N. H.	0	0	Yes <sup>(3)</sup>	Paved	No	15	No	
9	Newmarket Town Landing	Newmarket, N. H.	Lamprey R.	Town	0	0	Yes	Paved	No	3	No	
10	Belmonts Park	Newfields, N. H.	Squamscott (Exeter) R.	Private	0	10	Yes	Paved	No	30	No	
11	Chapman Boatyard	Stratham, N.H.	Squamscott (Exeter) R.	Private	0	0	Yes	Not Paved	No	13	No	
12	Stratham Town Landing	Stratham, N.H.	Squamscott (Exeter) R.	Town	0	0	Yes	Not Paved	No	2	No	

Notes:

(1) for locations see "Vicinity Map" on PLATE 1.

(2) scheduled for completion in 1970.

(3) useable only during half tide, or higher periods.

## EXISTING AND PROSPECTIVE COMMERCE

19. Waterborne commerce in the area is limited to the catch of a few part-time bait and lobster fishermen. Shellfishing in the Great Bay area and its tributaries is prohibited due to pollution. The Town of Newmarket, however, has acquired about 40 acres of land bordering the southwesterly side of the Lamprey River, about 2,000 feet downstream from the Newmarket Dam, on which will be constructed a sewage treatment plant. An industrial development is also planned for this property. This development may require future consideration of commercial navigation improvements.

## VESSEL TRAFFIC

20. There is no significant commercial vessel traffic in the area. There is, however, moderate recreational boat traffic. The boating season is about four months' duration extending from about 1 June to 1 October. There are 1270 recreational craft (see Table 4 on page 17) which are based either in, or on land bordering, the area's waters. This fleet is made up of 67% outboards, 10% inboards and sterndrives, 14% cabin cruisers and 9% sailboats. About 60% of this fleet, including most of the outboards and the small inboards, are land based trailered boats. About 20% are normally berthed or moored at commercial marinas while the remainder are berthed or moored at public and private docks and moorings. In general, owners of the cabin cruisers use their boats only on weekends, when, weather permitting, they cruise the Maine, New Hampshire and Massachusetts coastline. The owners of the smaller boats, in general, limit their activities to the waters within the study area, where they engage in boat angling (fishing from boats), cruising, sailing and boat hunting. Boat angling accounts for over 50% of all recreational boating activities. On peak boating days, usually occurring on weekends and holidays, there are about 100-150 boats actively engaged in recreational boating activities in the area. Most of these boats are to be found in the waters of Little Bay and the Piscataqua River. On other days, this number will drop to about 50 to 100 boats. In view of the rather small amount of boat traffic, as compared to the substantial number of boats based in the Great Bay area, it would appear that many of the local trailered boat owners prefer the use of other boating areas, of which there are a great number, in both New Hampshire and Maine.

TABLE 4  
RECREATIONAL CRAFT BASED IN THE AREA

Name of Waterway	City or Town	Sterndrives and				Auxiliary		TOTAL
		Outboards 10'-20'	Inboards 15'-30'	Cruisers 15'-30'	31'-50'	Sail 15'-30'	Sails 10'-25'	
Squamscott (Exeter) River	Exeter,	100	60	10	--	30	--	200
	Stratham,	30	--	--	--	--	--	30
	Newfields	10	--	--	--	--	--	10
Totals		140	60	10	--	30	--	240
Lamprey River	Newmarket	10	5	6	--	4	--	25
Bellamy River	Dover	10	10	--	--	--	--	20
Cocheco River	Dover	20	5	--	1	1	--	27
Oyster River	Durham	115	7	3	--	23	--	148
Piscataqua R.	Dover	5	3	2	--	--	25	35
	Eliot, Me.	125	10	15	--	--	--	150
	Newington	10	5	--	--	--	--	15
Totals		140	18	17	--	--	25	200
Salmon Falls R.	Dover	10	--	--	--	--	--	10
	Rollinsford	10	--	--	--	--	--	10
	So. Berwick, Me.	20	--	--	--	--	--	20
Totals		40	--	--	--	--	--	40
Little Bay	Dover	30	10	40	--	--	--	80
	Durham	15	--	2	2	1	10	30
	Newington	10	5	20	80	--	5	120
Totals		55	15	62	82	1	15	230
Great Bay	Durham	300	--	--	--	--	--	300
	Newington	10	5	--	--	--	5	20
	Greenland	10	5	--	--	--	5	20
Totals		320	10	--	--	--	10	340
GRAND TOTALS		<u>850</u>	<u>130</u>	<u>98</u>	<u>83</u>	<u>59</u>	<u>50</u>	1,270
%		67	10	14		9		100%

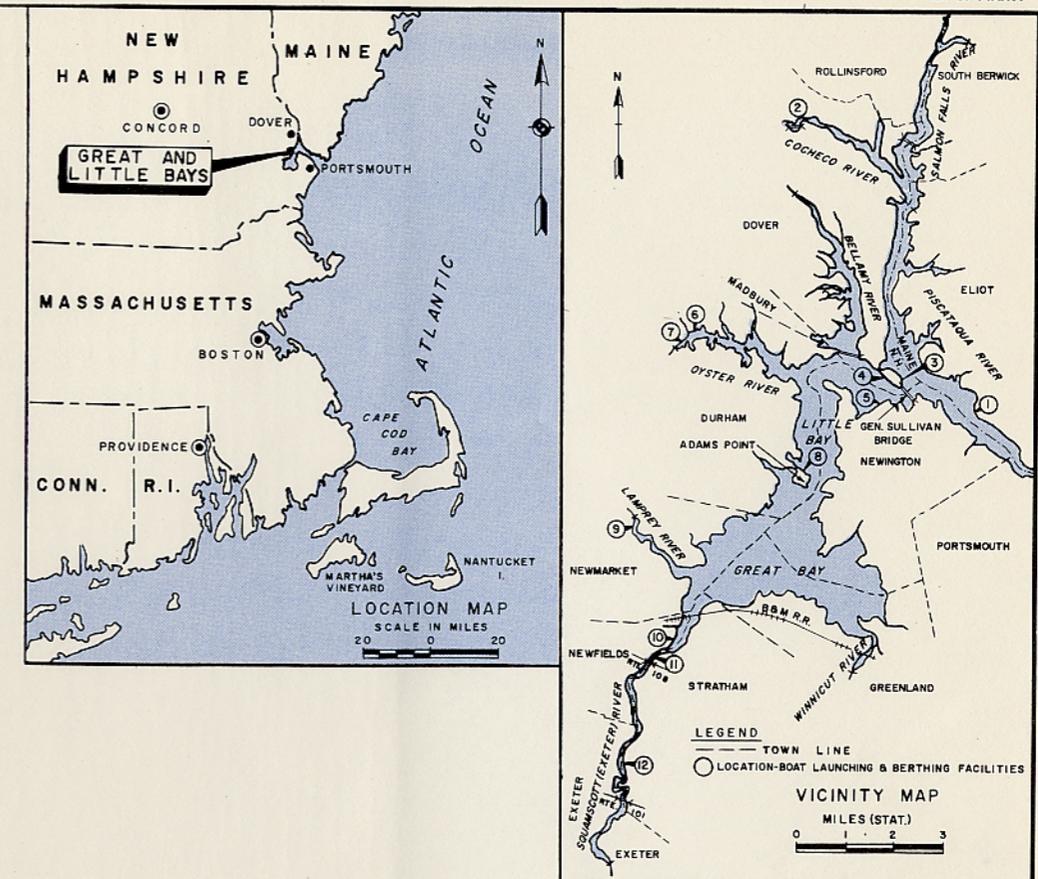
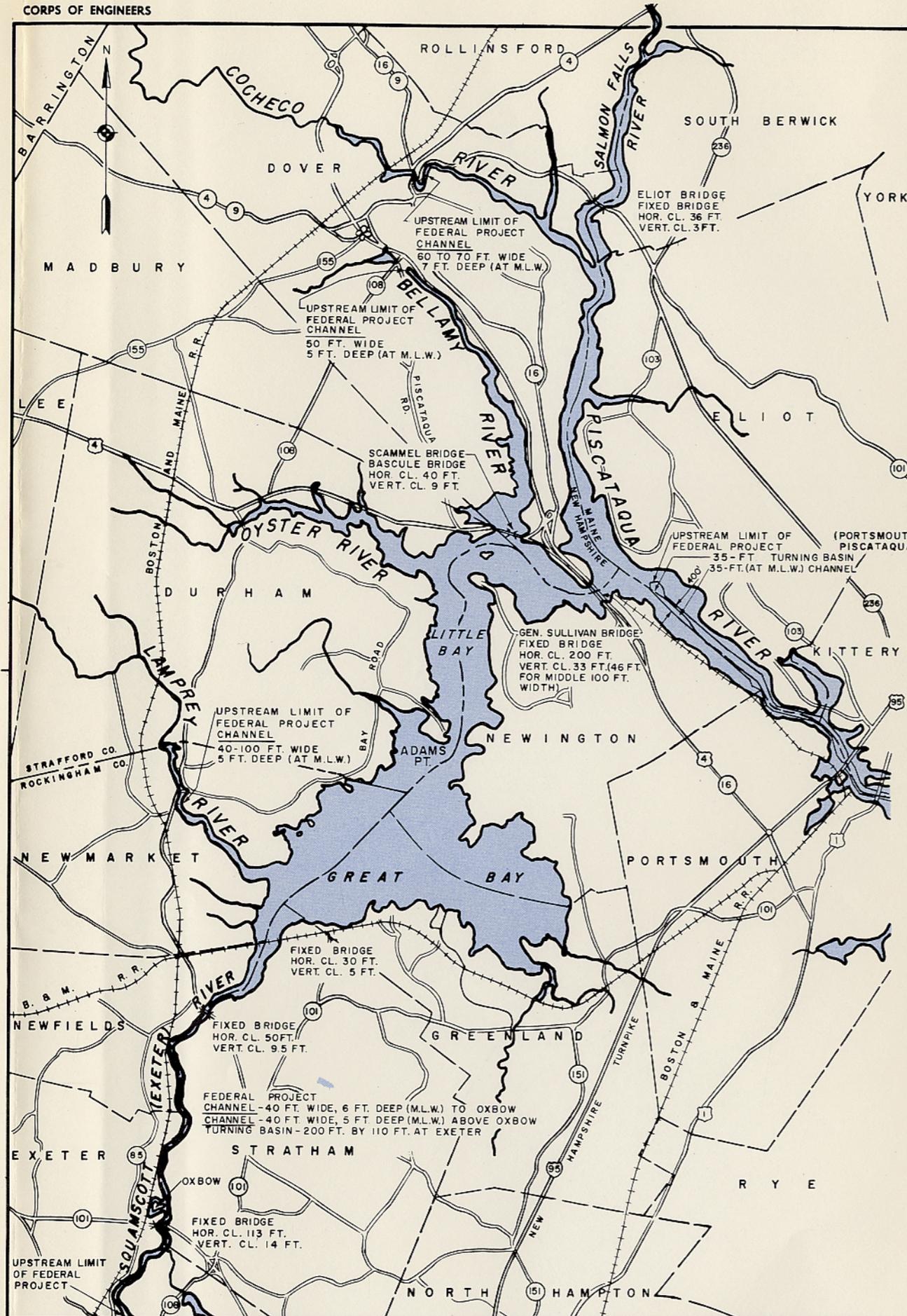
## IMPROVEMENTS DESIRED

21. A public hearing was held in Durham, New Hampshire on 23 June 1966 to determine the nature and extent of navigation improvements desired by local interests. Attendance was 128 and included representatives of Federal, State and local government agencies. The improvements requested were:

- a. Install additional boat ramps.
- b. Install additional channel and obstruction markers throughout waterways.
- c. Dredge an anchorage basin adjacent to each of the two town landings located along the Oyster River, Durham.
- d. Dredge a short access channel to the site of the proposed University of New Hampshire's Estuarine Laboratory on Adams Point at Great Bay, Durham.
- e. Dredge an access channel to the State boat ramp near Adams Point at Great Bay, Durham.
- f. Deepen and straighten the channels in the tidal portions of the Squamscott (Exeter), Lamprey and Salmon Falls Rivers.
- g. Alter the two fixed-span bridges; namely, the Route 108 Highway Bridge and the Boston & Maine Railroad Bridge, crossing the lower portion of the Squamscott (Exeter) River, to provide adequate vertical clearance to pass moderate size recreational boats.

## DIFFICULTIES ATTENDING NAVIGATION

22. The major difficulty attending navigation, particularly recreational boating, lies in the fact that the area, with few exceptions, consists of tidal waters made difficult of access by wide marshes and at low tide by wide mud flats. Other difficulties consist of inadequate channel markers in all of the waterways except the Piscataqua River and those in Great and Little Bays, inadequate boat launching facilities except for the area in the vicinity of the General Sullivan Bridge, and obstructive bridges over the lower portion of the Exeter (Squamscott), Bellamy and Salmon Falls Rivers. Table 5 on page 15 shows the present effective channel dimensions, together with navigation difficulties encountered at each of the various waterways within the study area.



WATERWAY	CITY/TOWN	NAVIGATION IMPROVEMENTS	
		CONSIDERED	RECOMMENDATIONS
OYSTER RIVER	DURHAM, N. H.	DREDGE ANCHORAGE BASIN AT TWO TOWN LANDINGS	NOT RECOMMENDED
GREAT BAY	DURHAM, N. H.	DREDGE ACCESS CHANNEL TO SITE OF UNIVERSITY OF N. H. ESTUARINE LABORATORY AT ADAMS POINT	NOT RECOMMENDED
GREAT BAY	DURHAM, N. H.	DREDGE ACCESS CHANNEL TO STATE OF N. H. BOAT RAMP AT ADAMS PT.	NOT RECOMMENDED
EXETER (SQUAMSCOTT) RIVER	NEW MARKET, STRATHAM, NEWFIELDS, EXETER, N. H.	DEEPEN, WIDEN AND STRAIGHTEN EXISTING AUTHORIZED FEDERAL CHANNEL	NOT RECOMMENDED
LAMPREY RIVER	NEW MARKET, N. H.	DEEPEN, WIDEN AND STRAIGHTEN EXISTING AUTHORIZED FEDERAL CHANNEL	NOT RECOMMENDED
SALMON FALLS RIVER	DOVER, N. H. ROLLINSFORD, ME. SO. BERWICK, ME.	DREDGE CHANNEL	NOT RECOMMENDED

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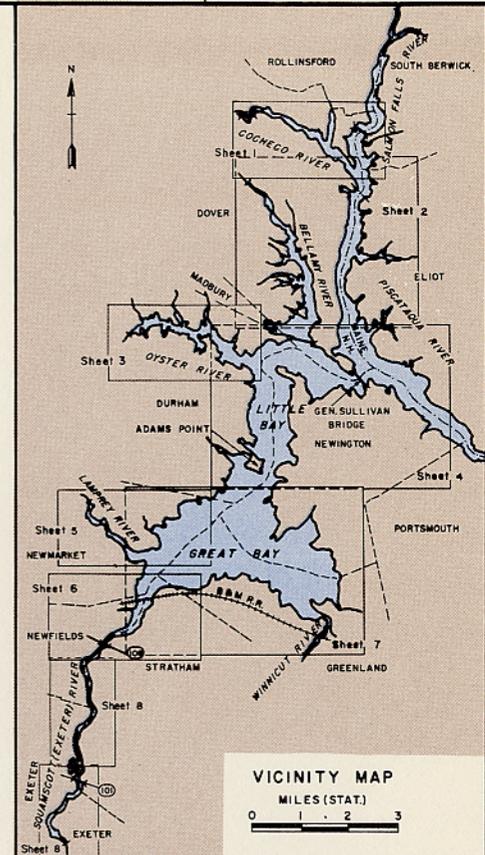
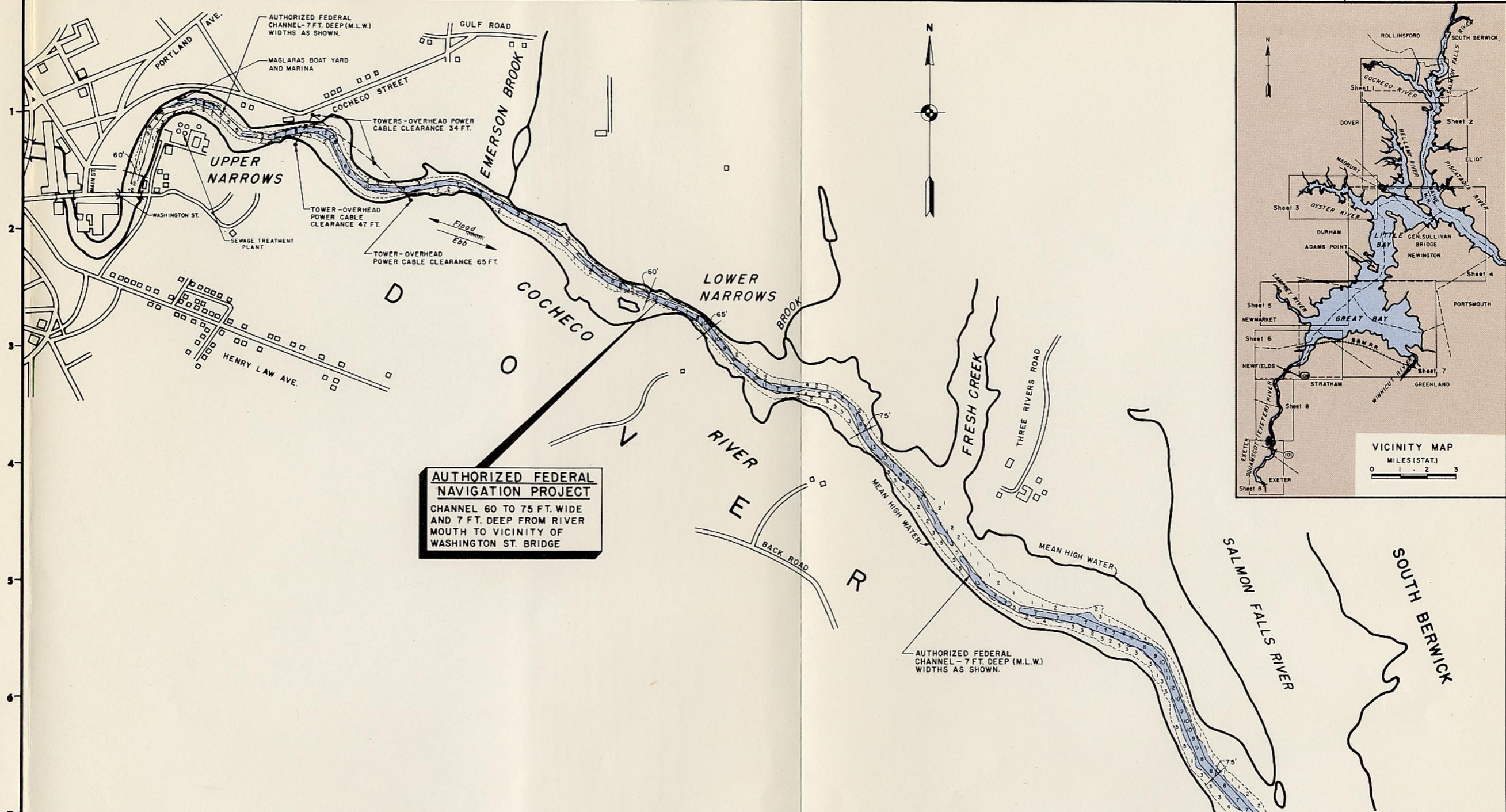
**GREAT AND LITTLE BAYS AND THEIR TRIBUTARIES, N.H. & ME.**

GENERAL MAP  
SCALE IN FEET  
5,000' 0 5,000' 10,000'

DATE OCT. 1969

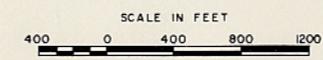
TO ACCOMPANY SURVEY REPORT  
DATED: 15 OCT. 1969

DRAWING NUMBER  
1865 D-8-3

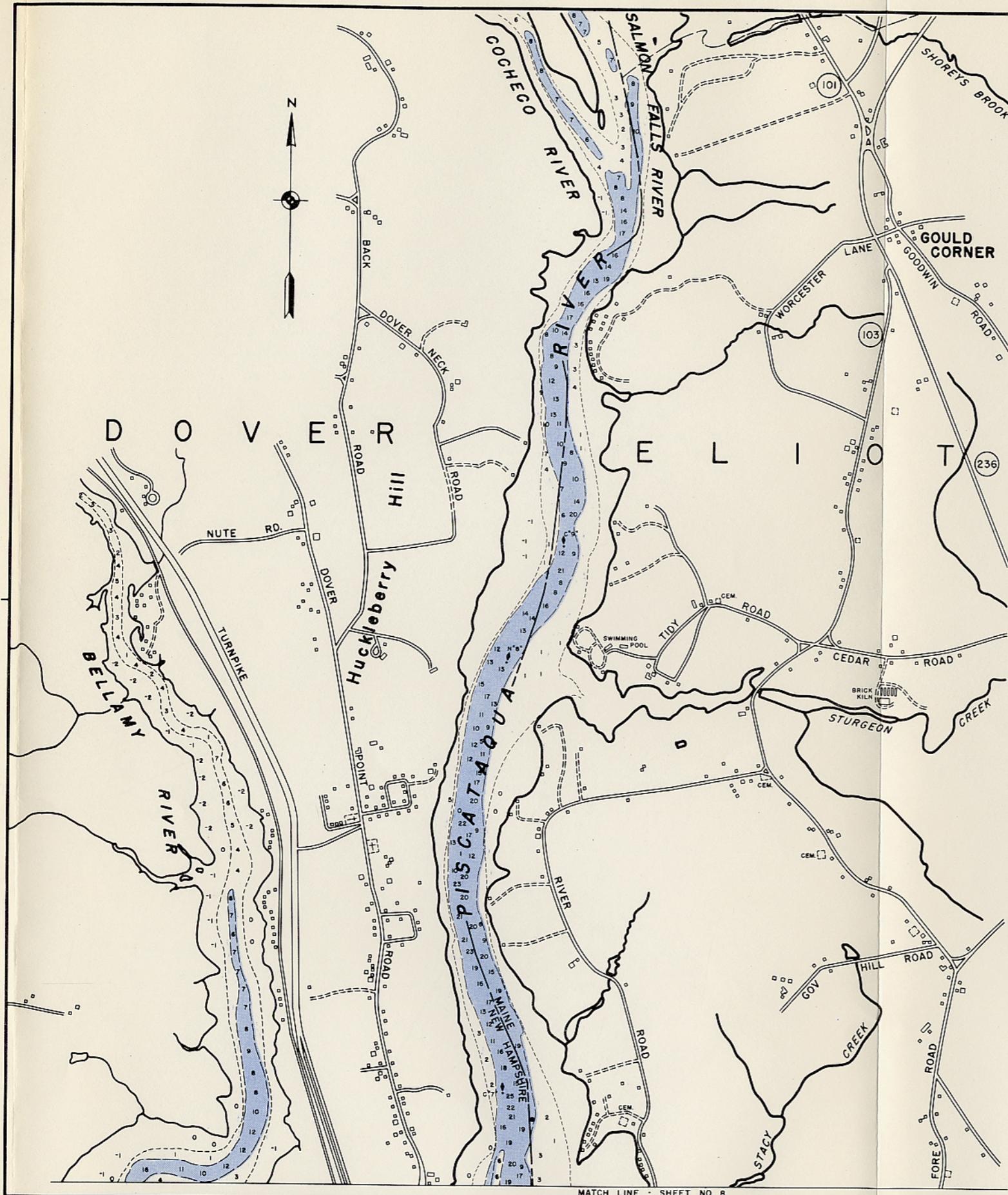


**AUTHORIZED FEDERAL NAVIGATION PROJECT**  
 CHANNEL 60 TO 75 FT. WIDE AND 7 FT. DEEP FROM RIVER MOUTH TO VICINITY OF WASHINGTON ST. BRIDGE

**NOTES**  
 Soundings are in feet and are referred to the plane of Mean Low Water.  
 Hydrography from survey of Aug. 1, 2, 3 and 7, 1967 by T. Ober and E. Byram.  
 Topography is from an enlargement of U.S. Geol. Survey Quad. Sheet of Dover East, N. H., dated 1956.  
 Field books R.B.H. 2423, 2424, 2425 and 2426.  
 Mean Low Water contour shown thus - - - - -  
 6-foot depth contour shown thus - - - - -  
 Channel areas in excess of 6.0 feet below Mean Low Water shown in blue.

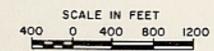


DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS.		
DR. BY L.R.L.	YR. BY L.R.L.	CR. BY R.B.M.
<b>GREAT AND LITTLE BAYS AND THEIR TRIBUTARIES, N.H. &amp; ME. COCHECO RIVER REPORT SURVEY</b>		
SUBMITTED BY: <i>[Signature]</i> PROJECT ENGINEER		
APPROVED: <i>[Signature]</i> CHIEF, COASTAL DEVELOPMENT SECTION		
TO ACCOMPANY SURVEY REPORT DATED: 15 OCT 1969		DATE: OCT. 1969
SCALE AS SHOWN		DRAWING NUMBER: 1865 D-8-3 SHEET 1 of 8



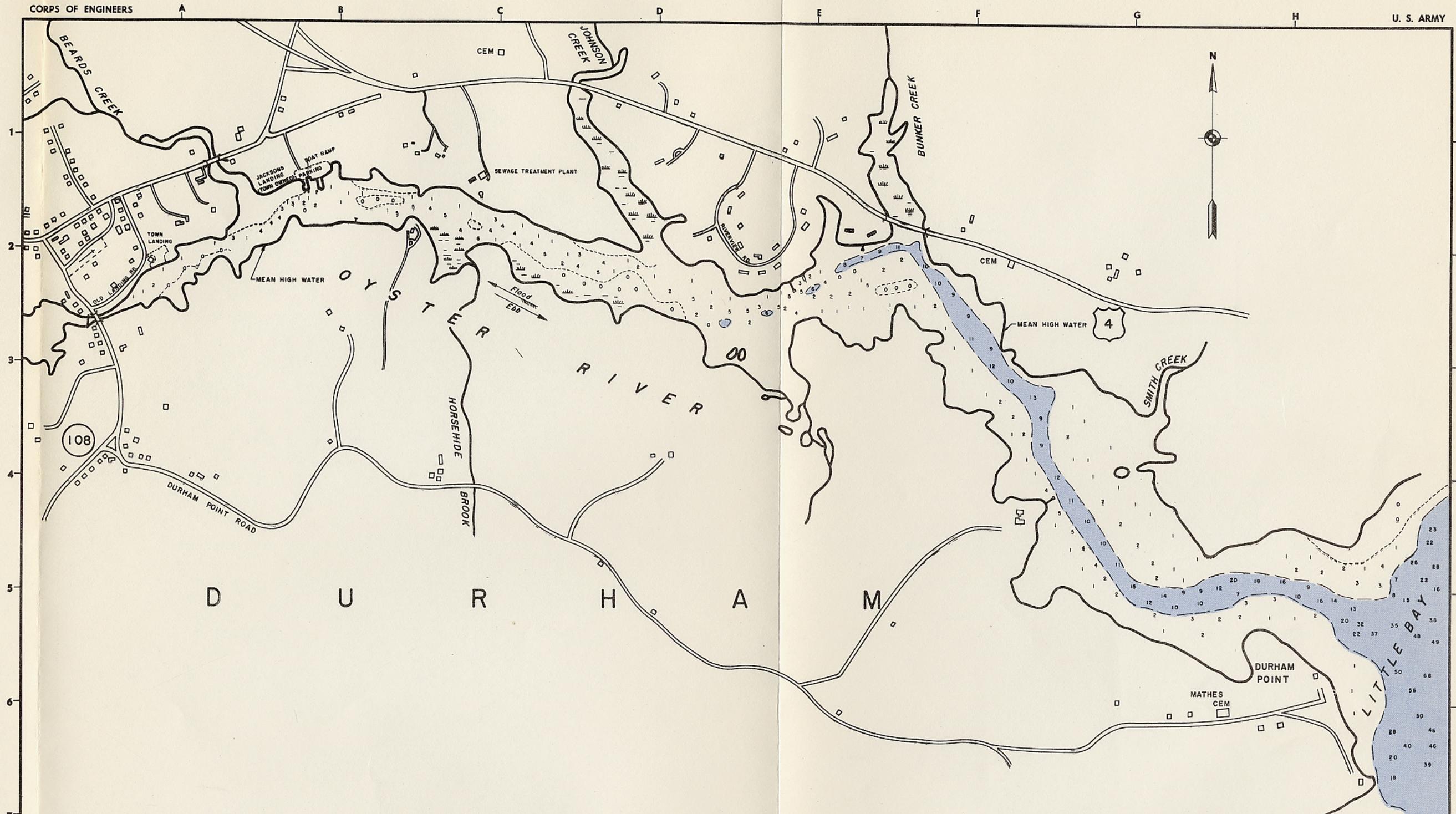
**NOTES**

Soundings are in feet and are referred to the plane of Mean Low Water.  
 Hydrography from U.S. Coast and Geodetic Hydrographic Survey No. 8094 made April 1953 - Sept 1954.  
 Topography is from an enlargement of U.S. Geol. Survey Quad. Sheet of Dover East, Me. - N.H., dated 1956.  
 Mean Low Water contour shown thus .  
 6-foot depth contour shown thus .  
 Channel areas, shown shaded in blue, have water depths below Mean Low Water of 6 ft. or greater.  
 See Plate 2 for Vicinity Map of area shown on this map.

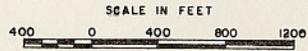


MATCH LINE - SHEET NO. 8

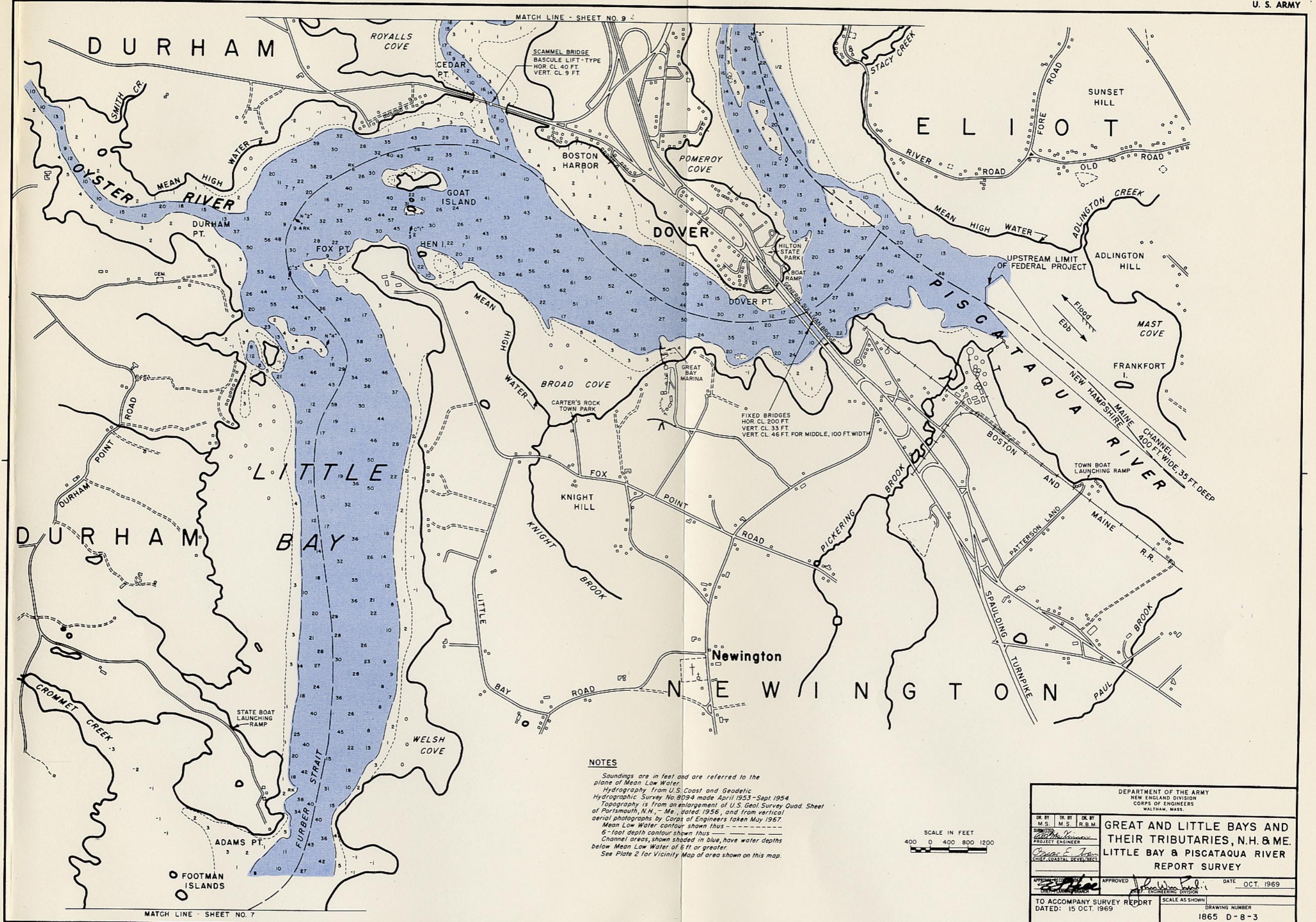
DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS.			
DR. BY M.S.	TR. BY M.S.	CHK. BY R.B.M.	<b>GREAT AND LITTLE BAYS AND THEIR TRIBUTARIES, N.H. &amp; ME. PISCATAQUA &amp; BELLAMY RIVERS REPORT SURVEY</b>
SUBMITTED PROJECT ENGINEER <i>[Signature]</i>			
APPROVED CHIEF COASTAL SURVEY DISTRICT <i>[Signature]</i>			DATE OCT. 1969
TO ACCOMPANY SURVEY REPORT DATED: 15 OCT. 1969			SCALE AS SHOWN DRAWING NUMBER 1865 D-8-3 SHEET 2 of 8



**NOTES**  
 Soundings are in feet and are referred to the plane of Mean Low Water.  
 Hydrography from U.S. Coast and Geodetic Hydrographic Survey No. 8094 made April 1953 - Sept. 1954.  
 Topography is from an enlargement of U.S. Geol. Survey Quad Sheet of Dover West, N.H., dated 1956, and from vertical aerial photographs by Corps of Engineers taken May 1967.  
 Mean Low Water contour shown thus .  
 5-foot depth contour shown thus .  
 Channel areas, shown shaded in blue, have water depths below Mean Low Water of 6ft or greater.  
 See Plate 2 for Vicinity Map of area shown on this map.



DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS.			
DR. BY L.R.L.	TR. BY L.R.L.	CK. BY R.B.M.	<b>GREAT AND LITTLE BAYS AND THEIR TRIBUTARIES, N.H. &amp; ME.</b> <b>OYSTER RIVER</b> <b>REPORT SURVEY</b>
SUBMITTED BY <i>Robert L. R. L.</i> PROJECT ENGINEER			
APPROVED BY <i>Charles E. Adams</i> CHIEF, COASTAL DEVELOPMENT			
APPROVED <i>John W. Pauli</i> CHIEF, PLANNING BRANCH			DATE OCT. 1969
TO ACCOMPANY SURVEY REPORT DATED: 15 OCT. 1969		SCALE AS SHOWN	DRAWING NUMBER 1865 D-8-3 SHEET 3 of 8



**NOTES**

Soundings are in feet and are referred to the plane of Mean Low Water.

Hydrography from U.S. Coast and Geodetic Hydrographic Survey No. 8094 made April 1953-Sept. 1954.

Topography is from an enlargement of U.S. Geol. Survey Quad. Sheet of Portsmouth, N.H., Me., dated 1956, and from vertical aerial photographs by Corps of Engineers taken May 1967.

Mean Low Water contour shown thus ————

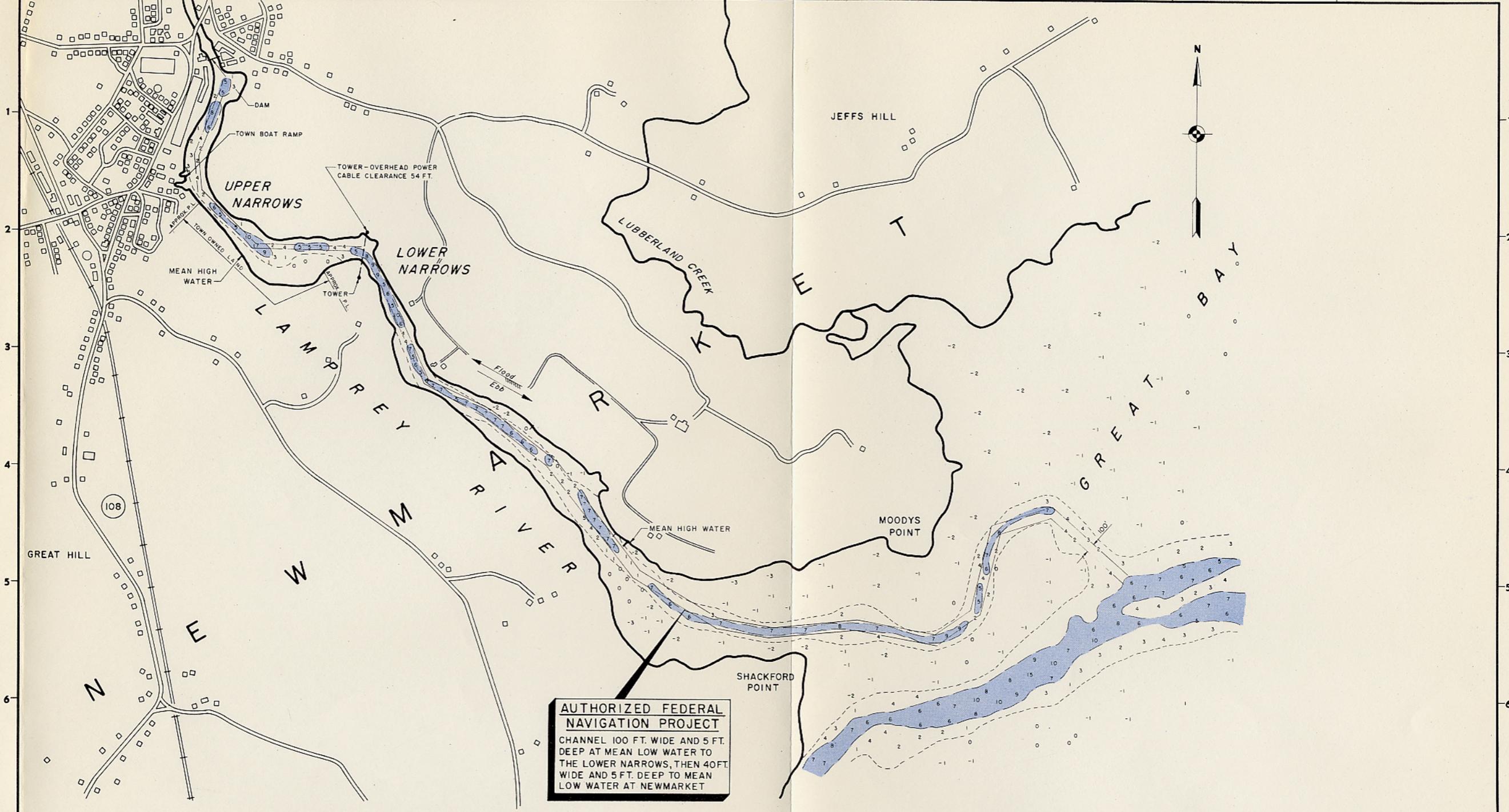
6-foot depth contour shown thus ————

Channel areas, shown shaded in blue, have water depths below Mean Low Water of 6 ft or greater.

See Plate 2 for Vicinity Map of area shown on this map.

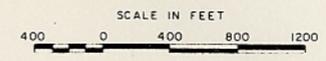
SCALE IN FEET  
400 0 400 800 1200

DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS.	
DR. BY M.S. M.S. R.B.W. SUBMITTED BY PROJECT ENGINEER APPROVED BY CHIEF, COASTAL DEVELOPMENT	<b>GREAT AND LITTLE BAYS AND THEIR TRIBUTARIES, N.H. &amp; ME.</b> <b>LITTLE BAY &amp; PISCATAQUA RIVER</b> <b>REPORT SURVEY</b>
APPROVED BY CHIEF, ENGINEERING DIVISION	DATE OCT. 1969
TO ACCOMPANY SURVEY REPORT DATED: 15 OCT. 1969	SCALE AS SHOWN DRAWING NUMBER <b>1865 D-8-3</b> SHEET 4 of 8

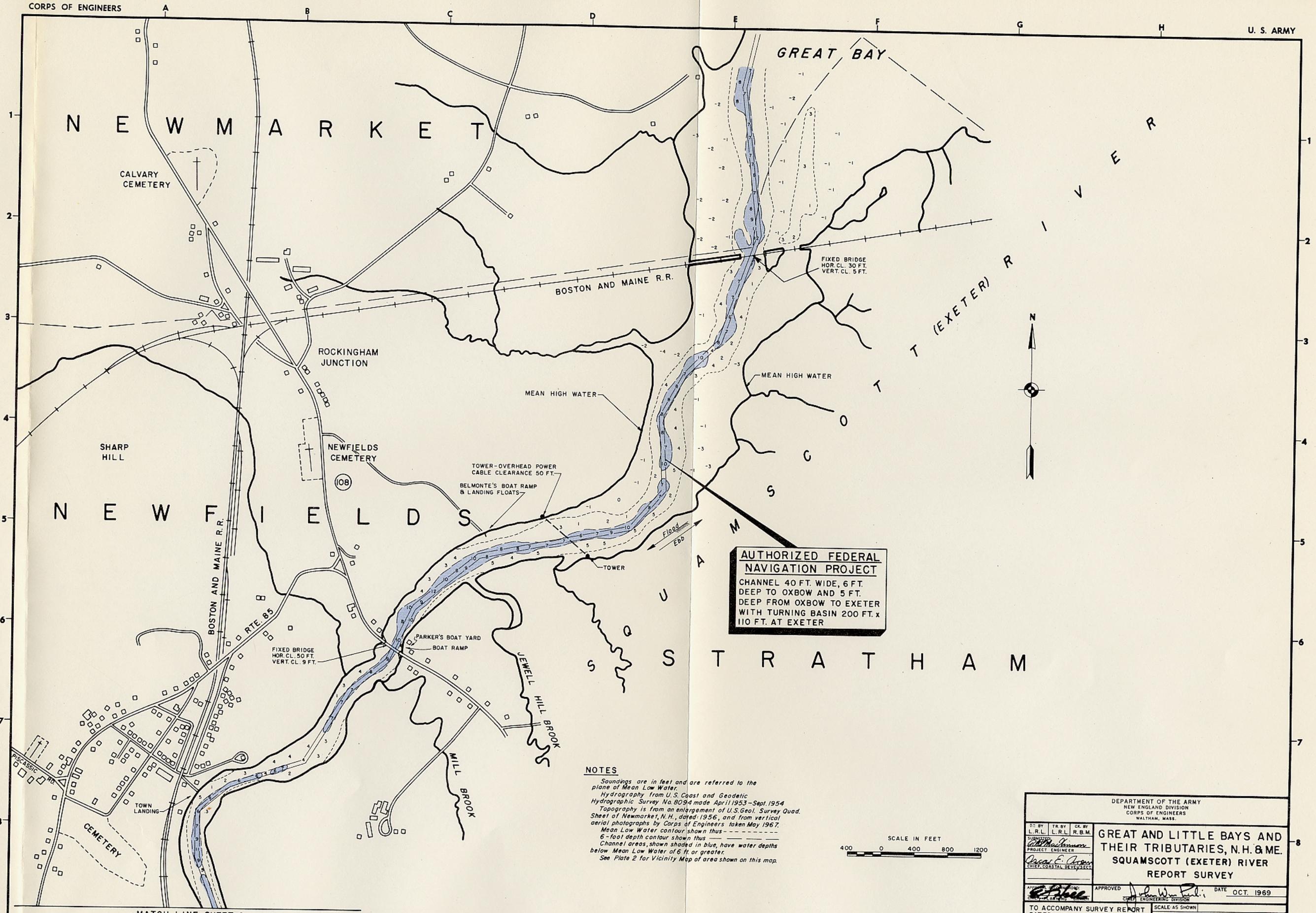


**AUTHORIZED FEDERAL NAVIGATION PROJECT**  
 CHANNEL 100 FT. WIDE AND 5 FT. DEEP AT MEAN LOW WATER TO THE LOWER NARROWS, THEN 40 FT. WIDE AND 5 FT. DEEP TO MEAN LOW WATER AT NEWMARKET

**NOTES**  
 Soundings are in feet and are referred to the plane of Mean Low Water.  
 Hydrography from U.S. Coast and Geodetic Hydrographic Survey No. 8094 made April 1953-Sept. 1954  
 Topography is from an enlargement of U.S. Geol. Survey Quad Sheet of Newmarket, N.H., dated 1946, and from vertical aerial photographs by Corps of Engineers taken May 1967.  
 Mean Low Water contour shown thus -----  
 5-foot depth contour shown thus -----  
 Channel areas, shown shaded in blue, have water depths below Mean Low Water of 5 ft. or greater.  
 See Plate 2 for Vicinity Map of area shown on this map.

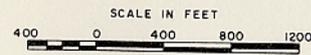


DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS.			
DR BY LRL	TR BY LRL	CH BY LRL	RM BY RBM
PROJECT ENGINEER			
CHIEF, COASTAL DEVEL. SECT.			
APPROVED			DATE OCT. 1969
CHIEF, ENGINEERING DIVISION			
TO ACCOMPANY SURVEY REPORT DATED: 15 OCT. 1969		SCALE AS SHOWN DRAWING NUMBER 1865 D-8-3 SHEET 5 of 8	



**AUTHORIZED FEDERAL NAVIGATION PROJECT**  
 CHANNEL 40 FT. WIDE, 6 FT. DEEP TO OXBOW AND 5 FT. DEEP FROM OXBOW TO EXETER WITH TURNING BASIN 200 FT. x 110 FT. AT EXETER

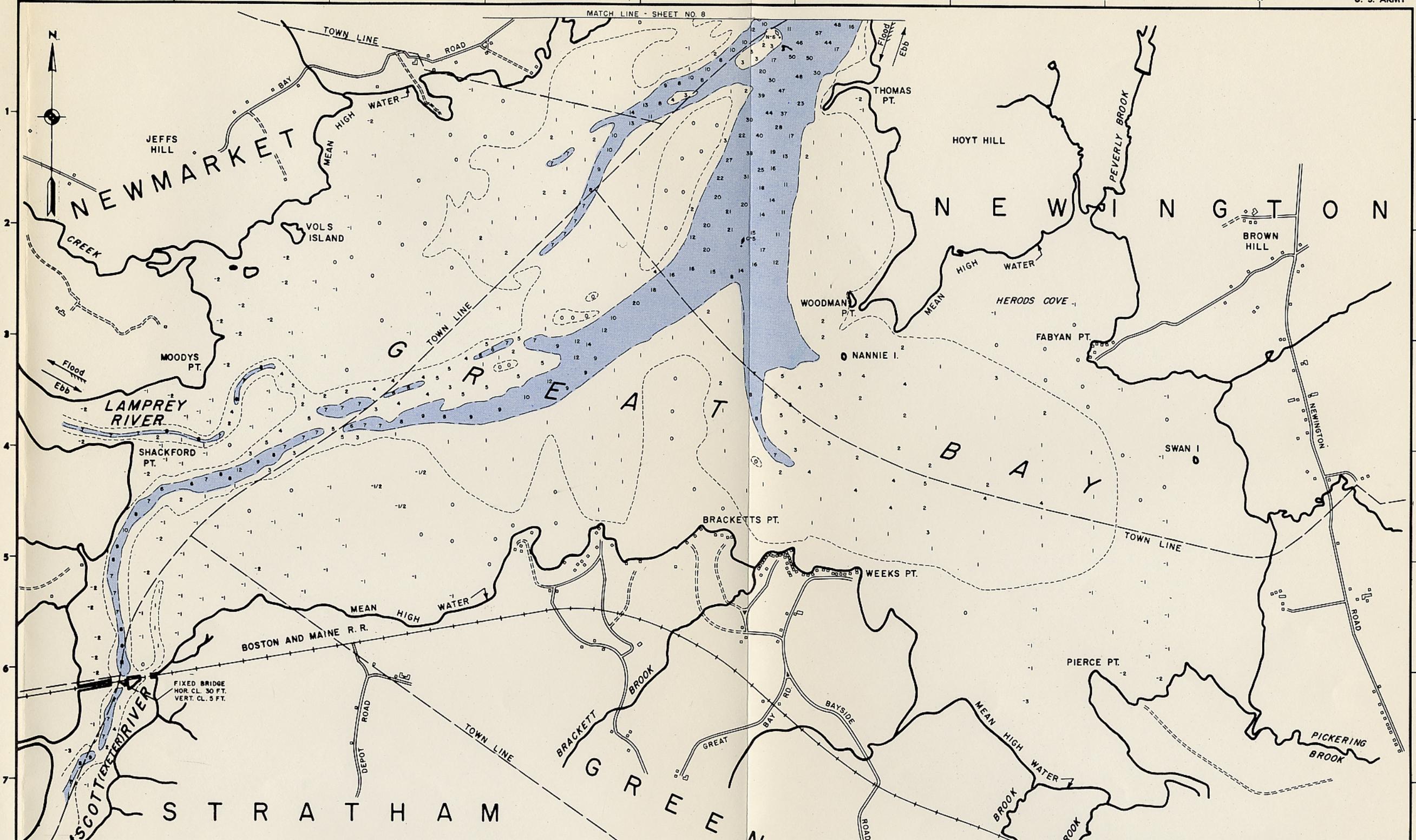
**NOTES**  
 Soundings are in feet and are referred to the plane of Mean Low Water.  
 Hydrography from U.S. Coast and Geodetic Hydrographic Survey No. 8094 made April 1953 - Sept. 1954  
 Topography is from an enlargement of U.S. Geol. Survey Quad. Sheet of Newmarket, N. H., dated 1956, and from vertical aerial photographs by Corps of Engineers, taken May 1967.  
 Mean Low Water contour shown thus - - - - -  
 6-foot depth contour shown thus - - - - -  
 Channel areas, shown shaded in blue, have water depths below Mean Low Water of 6 ft. or greater.  
 See Plate 2 for Vicinity Map of area shown on this map.



DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS.	
DRAWN BY: L.R.L. CHECKED BY: L.R.L. PROJECT ENGINEER: <i>W. H. ...</i> CHIEF, COASTAL DEVELOPMENT	<b>GREAT AND LITTLE BAYS AND THEIR TRIBUTARIES, N.H. &amp; ME.</b> <b>SQUAMSCOTT (EXETER) RIVER</b> <b>REPORT SURVEY</b>
APPROVED: <i>[Signature]</i> CHIEF, ENGINEERING DIVISION	DATE: OCT. 1969
TO ACCOMPANY SURVEY REPORT DATED: 15 OCT. 1969	SCALE: AS SHOWN DRAWING NUMBER: 1865 D-8-3 SHEET 6 of 8

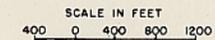
MATCH LINE SHEET 6

MATCH LINE - SHEET NO. 8

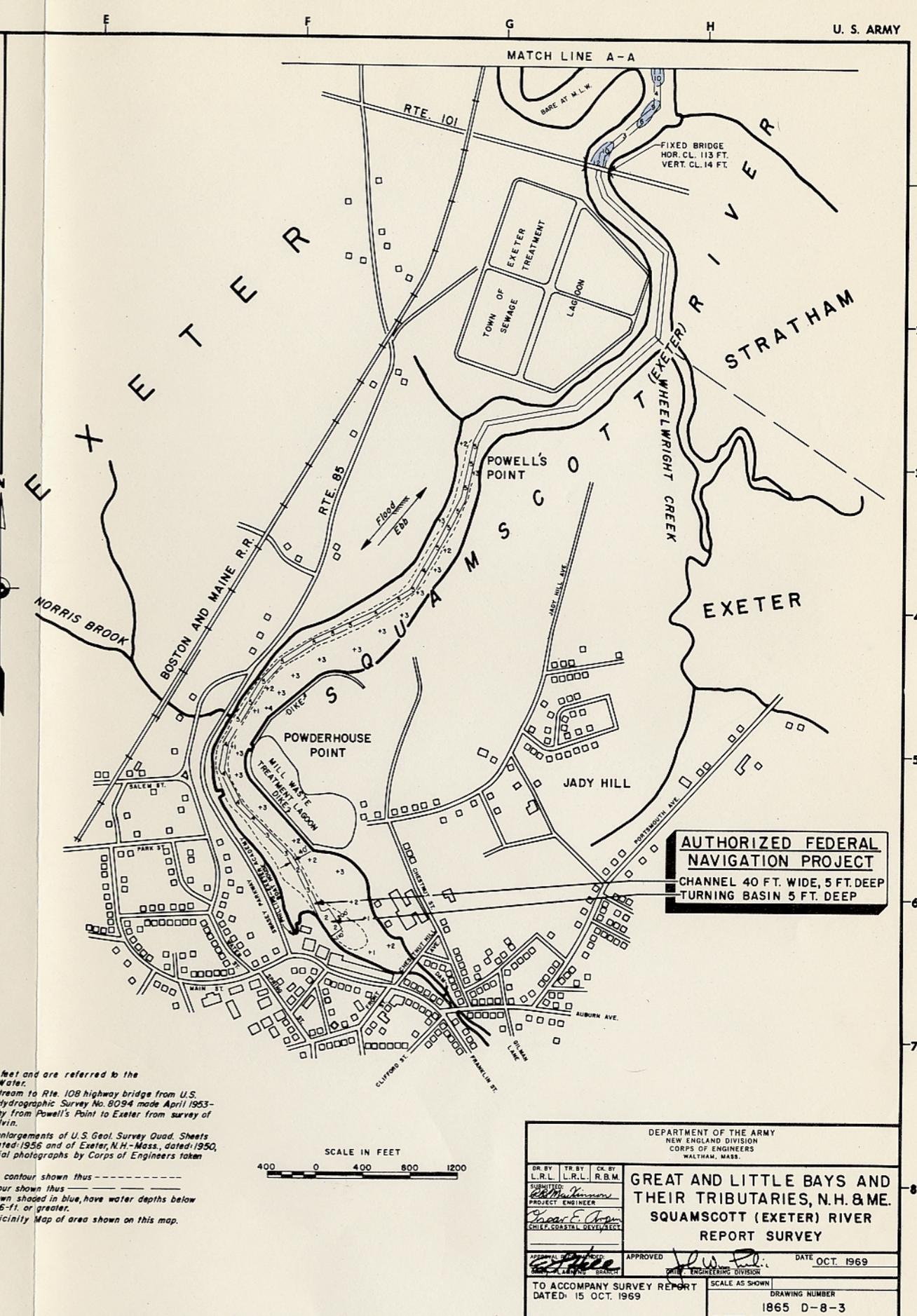
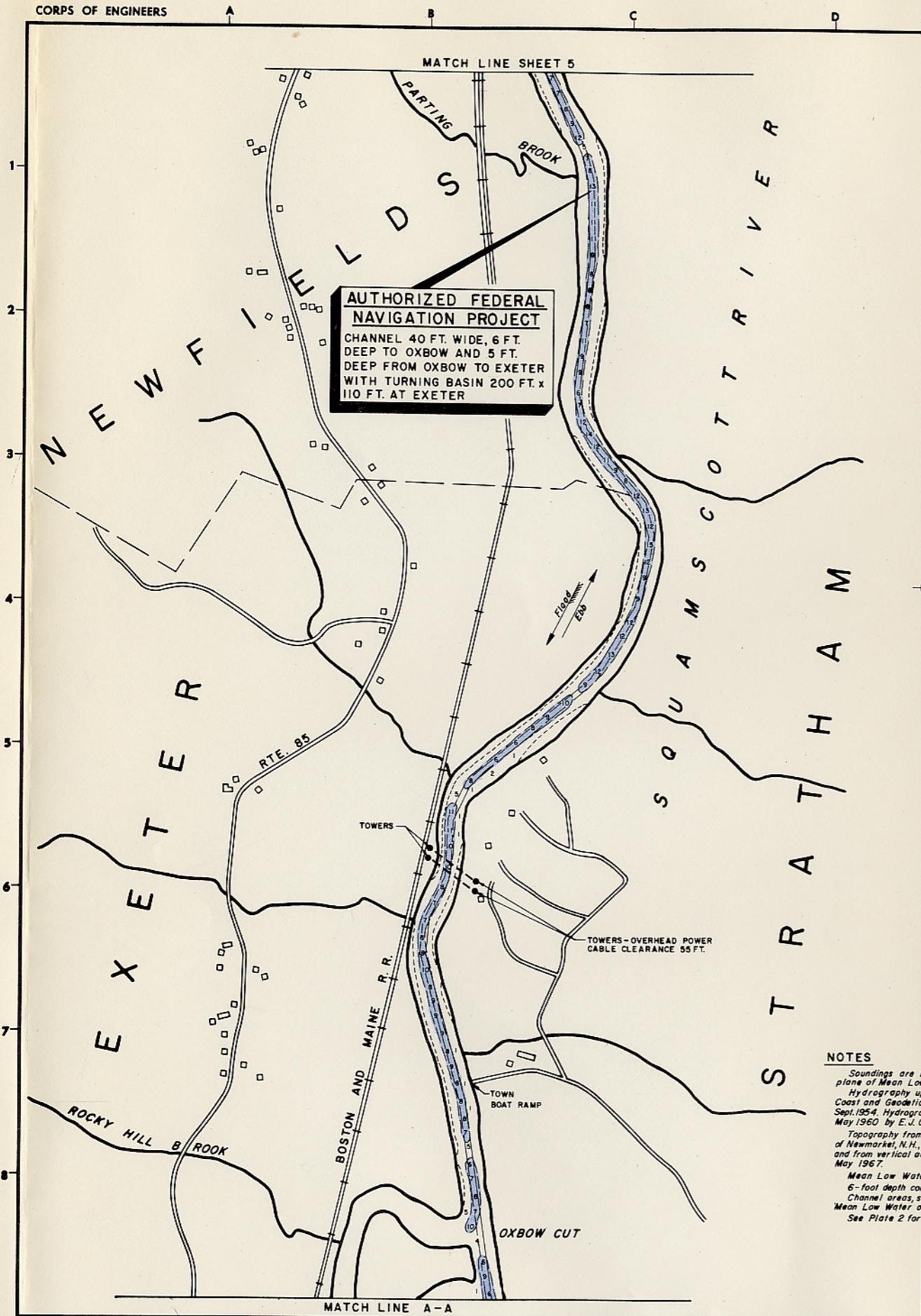


NOTES

Soundings are in feet and are referred to the plane of Mean Low Water.  
 Hydrography from U.S. Coast and Geodetic Hydrographic Survey No. 8093 made April 1953 - Sept. 1954  
 Topography is from an enlargement of U.S. Geol. Survey Quad. Sheets of Portsmouth and Newmarket, N.H.-Me., dated 1956, and from vertical aerial photographs by Corps of Engineers taken May 1967.  
 Mean Low Water contour shown thus - - - - -  
 6-foot depth contour shown thus ————  
 Channel areas, shown shaded in blue, have water depths below Mean Low Water of 6 ft. or greater.  
 See Plate 2 for Vicinity Map of area shown on this map.



DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS.			
DR. BY L. R. L.	TR. BY L. R. L.	CK. BY R. B. M.	<b>GREAT AND LITTLE BAYS AND THEIR TRIBUTARIES, N.H. &amp; ME.</b> <b>GREAT BAY REPORT SURVEY</b>
SUBMITTED BY <i>[Signature]</i> PROJECT ENGINEER CHECKED BY <i>[Signature]</i> CHIEF, COASTAL DEVELOPMENT			
APPROVED BY <i>[Signature]</i> CHIEF, ENGINEERING DIVISION			DATE OCT. 1969
TO ACCOMPANY SURVEY REPORT DATED: 15 OCT. 1969			DRAWING NUMBER 1865 D-8-3 SHEET 7 of 8



**NOTES**

Soundings are in feet and are referred to the plane of Mean Low Water.

Hydrography upstream to Rte. 108 highway bridge from U.S. Coast and Geodetic Hydrographic Survey No. 8094 made April 1953-Sept. 1954. Hydrography from Powell's Point to Exeter from survey of May 1960 by E. J. Colvin.

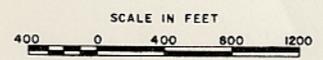
Topography from enlargements of U.S. Geol. Survey Quad. Sheets of Newmarket, N.H., dated 1956 and of Exeter, N.H.-Mass., dated 1950, and from vertical aerial photographs by Corps of Engineers taken May 1967.

Mean Low Water contour shown thus -----

6-foot depth contour shown thus -----

Channel areas, shown shaded in blue, have water depths below Mean Low Water of 6-ft. or greater.

See Plate 2 for Vicinity Map of area shown on this map.



DEPARTMENT OF THE ARMY NEW ENGLAND DIVISION CORPS OF ENGINEERS WALTHAM, MASS.		
DR BY L.R.L.	TR BY L.R.L.	CK BY R.B.M.
SUBMITTED PROJECT ENGINEER		
APPROVED CHIEF, COASTAL DEVELOPMENT		
APPROVED		DATE OCT. 1969
TO ACCOMPANY SURVEY REPORT DATED: 15 OCT. 1969		SCALE AS SHOWN DRAWING NUMBER 1865 D-8-3 SHEET 8 of 8

TABLE 5  
CHANNEL FEATURES AND PRESENT NAVIGATION DIFFICULTIES

Name of Waterway	Fed. Navig. Proj.	Length (miles)	Existing Channel- Minimum Dimensions		Present Navigation Difficulties
			Width	Depth (at MLW)	
Squamscott (Exeter) R.	Yes	7	50'	4' for lower 6½ mi., then 2'	(1) (3) Shallow depths upper ½-mi. section. Fixed spans at RR & Hwy bridges near river mouth with vert. clear. at MHW of 5' & 9.5' inadequate to allow passage except for outboard
Lamprey R.	Yes	2	40'-50'	2'	(1) Shallow depths. Reported rocks in upper sect. between Lower and Upper Narrows
Oyster R.	No	3	75'	Lower ½ mi. sec. 7', then 1'	(1) Upper half shallow channel and anchorage
Bellamy R.	Yes	4	50'	Lower half 4' Upper half 2'*	(1) Upper half shallow water. Hwy drawbridge near mouth with 9' vert. clear. impediment to convenient navigation, except for outboards.
Cocheco R.	Yes	3	50'	4'	(1)(3) Stench from sewage pollution in river.
Salmon Falls R.	No	4	50'*	4' lower 1½ mi. then 2'*	(1)(2)(3) Fixed span at hwy bridge, with 5' vert. clear., 1 mi. from mouth, inadequate to allow boat passage except for outboards
Piscataqua R.	No	5	200'	6'	(2) Reported rocks in access channel to State boat ramp at Hilton Park at Dover Point.
Little Bay	No	5	300'	12'	Strong currents in vicinity of General Sullivan Bridge, particularly on ebb tide.
Great Bay	No	4	100'	6'	(1)(2)(3)

(1) Inadequately marked channel.

(2) Extensive tidal flats extending from shore to channel prevents boat launching during low tidal periods.

(3) Inadequate public docking or launching facilities.

\*Estimated.

## WATER POWER AND OTHER SPECIAL SUBJECTS

23. All waterways within the study area are tidal. There is no opportunity for development of the area for water, power, flood control, or other related purposes.

24. One of the two authorizing documents for the present study, namely, the House Resolution adopted 24 June 1965 (see paragraph 1, page 1) specifically requests a review of the report on Great Bay published as Senate Executive Document No. 44, 48th Congress, 1st Session. This report dealt with the construction of a dam, to include a lock, across the Piscataqua River a short distance downstream from the mouth of Great and Little Bays. The principal object sought by the construction of a dam was a reduction of currents in the Piscataqua River and Portsmouth Harbor below the bridge. A secondary benefit was anticipated through the betterment of navigation above the dam by higher water levels with greater water depths. The foregoing report was favorable to the dam construction. However, it was never built due to lack of funding. Subsequently, a Preliminary Examination (Review of Reports) of Portsmouth Harbor, made in 1909 and published as House Document No. 1086, 61st Congress, 3d Session, reviewed the matter and reported unfavorably. The principal objections at that time, to the construction of a dam, was: anticipated shoaling in the waterways, both above and below the dam, due to decreased current; claims for damages from water power owners; claims for damages from owners of lands that would be inundated by the dam; and ice formations, particularly above dam.

25. The effects of a dam, either at the location contemplated under the previous study or in the vicinity of the General Sullivan Bridge at the confluence of the Piscataqua River and the mouth of Little Bay, have been considered in this study. Any such structure, be it a halftide or fulltide dam, with or without gates or locks, would significantly affect the salinity in Great and Little Bays and their tributaries, damaging one of the best true estuarine environments on the New England coast. The affected area is a profile finfish, shellfish and wildfowl habitat and any proposals which would alter the salinity in the region must be considered with this in mind. In addition, reduction of the tidal flushing action, which would result from the dam construction, would increase the existing water pollution problem, even with respect to treated wastes, and could also encourage shoaling. In view of the above, further consideration of a dam, either across the Piscataqua River or any portion of Great or Little Bays or their tributaries, is unwarranted.

## PROJECT FORMULATION

26. None. (See DISCUSSION).

### DISCUSSION

27. At the public hearing held in 1966 in connection with this study or at numerous subsequent meetings between State and municipal authorities and representatives of the Corps of Engineers, the most recent being in May 1969, local interests have expressed desires for recreational navigation facilities, including additional boat ramps, additional channel markers; alterations to obstructive bridges over the Exeter (Squamscott) and Salmon Falls Rivers; anchorage basins at the Oyster River; access channels at Great Bay to both the State boat ramp and the State Estuarine Laboratory at Adams Point; improvement dredging of the Salmon Falls River waterway, and; modification of the Exeter (Squamscott) and Lamprey River projects to provide wider, deeper and straighter channels than now authorized. Some of these requests concerned items outside the purview of the Corps of Engineers. Other requests were more properly the responsibility of other public agencies.

It is further noted that present policy does not permit the use of public funds to dredge an interior access channel to a private berth such as has been requested to the site of the University of New Hampshire's Estuarine Laboratory. It is also noted that dredging work in the Oyster River and Salmon Falls River or in the access channel to the State boat ramp at Adams Point, and widenings of the channels at the Exeter (Squamscott) and Lamprey Rivers beyond their authorized widths, in view of their expected usage solely for recreational boating, would require substantial cost sharing by local interests totalling at least 50 percent of the first cost of the improvement.

Local authorities subsequently expressed their views that the municipalities, at this time, are financially unable to participate in these improvements. The local officials suggested that present needs could be substantially met through restoration of the Exeter (Squamscott), Lamprey, Bellamy and Cocheco River projects to their authorized dimensions. No further Congressional authority is needed for this work. However, it is noted that the lower half

of the Exeter and Bellamy Rivers (see Table 5 on page 15) have effective channel widths of about 50 feet and depths, at mean low water, of about 4 feet, while their upper halves have widths of 40 feet and depths of 2 feet (MLW). The Lamprey River has an effective channel width of about 40-50 feet and depth of about 2 feet (MLW). The Cocheco River has an effective channel width of about 50 feet and depth of 4 feet (MLW). At high tide, these depths increase by 6 to 7 feet. Considering the small amount of boat traffic on these waterways (see Para. 20), it is considered that their present effective channel dimensions are adequate to meet present boating needs and will so remain until the navigation difficulties of inadequate channel markers, obstructive bridges, inadequate boat launching facilities, and water pollution, are resolved.

28. It is considered appropriate to include in this report a brief discussion concerning anticipated future growth of recreational boating in the region and suggest a program to assure adequate navigation facilities to meet public needs generated by this growth. New England's future outdoor recreation demand is expected to skyrocket. A larger population, expected to more than double in the next fifty years, lower median age, higher incomes, and greater mobility will influence recreational activities immensely within the next few decades. Recent projections made by the Outdoor Recreation Resources Review Commission and the Bureau of Outdoor Recreation indicate an average annual growth of over 6% during the next 40 years for recreational boating (exclusive of canoeing and sailing) throughout the United States. Records of the New Hampshire Department of Safety show that during the period 1948-1967 the average annual growth for motor-boating on inland waters of New Hampshire was at a rate of about 13%. It is expected that this trend will continue and that recreational boating in the New Hampshire-Maine area will continue to grow at a rate about double that of the rest of the country, providing that adequate boating facilities are provided.

29. Great and Little Bays offer approximately 6,100 acres (about  $6\frac{1}{2}$  square miles) of protected open salt water while the tidal portion of its tributaries offer 28 miles of river, all of which have great potential for development for recreational use. Practically every kind of salt water fishing is to be found in these waters, with Little and Great Bays having an outstanding potential for shellfishing. It

is also a habitat for many forms of wildlife. The area, with few exceptions, consists of tidal waters bounded by wide marshes and at low tide by wide mud flats. These conditions, plus inadequate channel marking, docking and launching facilities, and obstructive bridges over the Exeter (Squamscott), Bellamy and Salmon Falls Rivers, have been primary factors retarding boating growth in the area.

30. A suggested program, with items listed more or less in the order of priority, to provide for adequate navigation facilities to meet future recreational boating needs, is as follows:

a. Water Pollution: the waters within the study area are presently polluted to a significant degree, due mainly to the disposal of untreated sanitary sewage and millwaste into these waters. Although this condition does not directly affect recreational navigation, the odors associated from this type of water and air pollution prevent full enjoyment of these waters for recreational boating. The present Federal, State and municipal programs provide for the correction of this condition with the objective of cleaning up in accord with an approved time schedule and dependent on the appropriation of funds.

b. Channel and obstruction markers: Buoying of channels and obstructions within Great and Little Bays and the Piscataqua River has been accomplished by the U. S. Coast Guard. This coverage appears to be entirely satisfactory. However, in all other rivers within the study area, except for the upper portion of the Exeter (Squamscott) River, there is a lack of channel markers. This condition could be remedied at a relatively small cost by the installation and maintenance of buoys by local interests.

c. Boat launching and docking facilities in the area for non-trailer boats appear to be adequate. However, similar facilities for trailer boats are needed. The national trend in recreational boating is toward the use of more trailer boats; mainly, outboards. In recent years over 85% of all recreational craft constructed (excluding rowboats, canoes and sailboats) are in this class. This trend is expected to continue. Minimum requirements for a well designed boat ramp facility include: convenient and serviceable access road; parking area with space for trailer parking; fuel supplies, either on the premises or in close proximity thereto; serviceable

ramp, preferably paved; access channel to deep water. Of the 5 publicly-owned and 4 commercially-owned boat ramp facilities in the area, only 2 or 3 would meet the above criteria. Local interests should consider a program that would not only improve the present publicly-owned boat ramp facilities in the area but would also plan for additional facilities to meet future needs. It would seem, in view of expected future land development and rising cost, that land for such sites should be acquired at the earliest possible time.

d. Obstructive Bridges - There are four bridges crossing the lower portions of the Exeter (Squamscott), Bellamy, and Salmon Falls Rivers (see paragraph 12 for details) which seriously restrict upstream navigation. The lower bridge across the Exeter River is owned by the Boston and Maine Railroad and has a vertical clearance of 5 feet at mean high water. It was built originally as a draw-bridge but was converted to a fixed-span bridge in 1955. The upper bridge over the Exeter River and the bridge over the Salmon Falls River are both State-owned, fixed-span highway bridges with vertical clearances at mean high water of 9.5 feet and 5 feet, respectively. Both originally contained drawspans which were converted to fixed-spans in 1955 and 1938, respectively. The Bellamy River Bridge is a State-owned highway bridge containing a drawspan with a vertical clearance at mean high water, when bridge is closed, of 9 feet. Its navigation difficulty stems from the fact that a 4 hour notice is required before opening. The U. S. Coast Guard has jurisdiction over bridges across navigable waterways. This agency may be expected to make such bridge alterations or changes in bridge rules and regulations as are warranted by boat traffic conditions.

#### COORDINATION WITH OTHER AGENCIES

31. All Federal, State and local agencies having an interest in improvement of the waterways under study were notified of the public hearing held at Durham, New Hampshire. In addition, consultations were later held with State and municipal officials representing all of the communities bordering these waterways. Comments of the States and the U. S. Fish and Wildlife Service are contained in Appendix C and B of this report.

## CONCLUSIONS

32. Great and Little Bays and connecting waterways comprise a waterway area of almost 14 square miles, all protected from storm waves. The area is used by a fleet of some 1,270 boats. Commercial use of the waterways is negligible. The recreational fleet is amply provided with deep water although access to the waterways, public landing facilities, inadequate parking areas and other deficiencies inhibit the growth of boating. The waterway is located in a fast growing part of New England with increasing demands for water access. Recreational boating demands are growing at a rate of 13% annually in adjacent areas. Local interests have requested Federal improvement of items normally considered a local responsibility. These items, such as construction of boat ramps and access channels to private berths, are usually provided by private enterprise or through local government sponsorship. The channels and anchorage areas required in connection with boat launching facilities are generally adequate at this time pending further expansion of the shore features.

It is further noted that land ownership in the Great Bay area is in large holdings, and a few owners control large sections of shore frontage. It would appear that the various municipalities might find it beneficial to establish zoning control, where not in existence, to guide the development of this shore frontage in the future. In this way, the municipalities can decide and assure the type of development desired. Further acquisition of shore frontage by the municipalities or state will permit the construction of facilities to meet the needs of recreational boating as those needs become apparent.

The Division Engineer therefore finds that the waterways within the study area are adequate to meet the present needs of navigation. He notes that the State of Maine proposes to correct the deficiency in public launching facilities within the Maine portion of the study area before the 1970 boating season, by constructing a boat ramp, with supporting access roads and parking facilities, along the north shore of the Piscataqua River in the Town of Eliot. He believes that the State of New Hampshire or the individual towns should initiate a program for the improvement of existing publicly-owned boat launching and docking facilities and the construction of others to meet the demonstrated needs of trailered recreational craft. The Division Engineer also is of the opinion that a dam as previously proposed across the Piscataqua River or any of the other waterways within the study area would materially upset the fish and wildlife resources of the area and its construction should not further be considered at this time.

## RECOMMENDATIONS

33. The Division Engineer recommends no modification to the Federal navigation projects at the Exeter (Squamscott), Lamprey, Bellamy or Cocheco Rivers. He considers that no navigation improvements to any of the other waterways within the study area are warranted at this time. He urges local interests in New Hampshire to consider a program for the improvement of existing publicly-owned boat launching and docking facilities and the construction of others to meet the needs of trailered and other recreational craft.

E. P. STEFANIK  
Lt. Colonel, Corps of Engineers  
Acting Division Engineer

APPENDIX A  
 DIGEST OF PUBLIC HEARING TESTIMONY  
 (Hearing Held at Durham, N. H.)

23 June 1966

No.	Individual or Agency	Represented at Hearing By	See Exhibit No.	Digest of Expressed Views
1	U.S. Sen. Norris Cotton	--	1	Notes \$7,000 available for study, is interested in survey.
2	U. S. Coast Guard	--	2	Interest limited to aids to navigation.
3	U.S. Dept. of Health, Education & Welfare	--	3	Navigation improvements would not involve Public Health Service.
4	Me. Dept. Sea & Shore Fisheries	George Taylor	4	Me. primary interest is to insure that none of its fisheries and wildlife (lobsters, oysters, striped bass, flounders) resources are endangered by any project. Requests any improvement plan leave oyster beds and marshland undisturbed.
5	Me. Dept. Inland Fish & Game	--	11	Area no. of Sturgeon Cr. is habitat of geese and black duck. Recommends no disruption of this habitat by dredging or spoiling operations. Area contains extensive eelgrass.
6	N.H. State Port Authority	E. P. Soles, Chairman	5	Endorses study providing 'study is all-inclusive to develop the area concerned, and to provide for the best use of these waters in the interest of the general public'.
7	Austin F. Quinney-N. H. Councillor	Himself	-	Supports "necessary required improvements".

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APPENDIX A (Cont'd)

No.	Individual or Agency	Represented at Hearing by	See Exhibit No.	Digest of Expressed View
8	Me. Dept. of Resources & Economic Development	S. F. Rowe, Comm.	--	Echoes position of N. H. Port Authority
9	N. H. Fish & Game Dept.	B. Corson	6	Stresses important fish & game resources in area, requests a complete hydrographic and biological survey be made in conjunction with the navigation study to assure no adverse effects on fish & game resources.
10	N. H. Seacoast Reg. Dev. Assoc.	Sen. D. E. Hunter, Pres.	7	Requests study also consider marine fisheries resources.
11	The Seacoast Regional Plan	R. Preston, Exec. Dir.	8	Requests study also consider all interests for fish & wildlife, and recreation purposes.
12	Governor of N. H.	Miss M. L. Hancock	--	Requests all local & State agencies' plans be considered and coordinated with the navigation study.
13	N. H. Div of Parks	R. Tobey, Director	--	Interest limited to parks and onshore facilities.
14	N. H. Dept. of P. W. & Highways	M. J. Chase	21	Furnished informational list of bridges in area.

APPENDIX A (Cont'd)

No.	Individual or Agency	Represented at Hearing by	See Exhibit No.	Digest of Expressed View
15	Univ. N.H. (Estuarine Lab)	Dr. G. E. Jones, Dir.	9	Proper development & management of area extremely important to State and to Univ. who plan to construct a marine lab. this year at Adams Pt. Requests channels in Little Bay be straightened, widened and deepened.
16	Univ. of N.H.	J. A. Chase, Vice Pres.	--	Favors Study
17	N. H. Water Pollution Comm.	--	10	Favors any project for improvement of recreational boating and fish & wildlife resources. Requests they be advised of any proposed plan involving dredging that might affect shellfish beds and turbidity of waters.
18	Rockingham-Strafford County Rural Areas Dev. Comm.	--	12	Favors Study.
19	Rep. F. A. Sewall, Newmarket	--	13	Interested primarily in Lamprey River, Newmarket owns $\frac{1}{2}$ mile of land (40 acres) bordering river, plans shortly to constr. sewage treatment plant.
20	City of Dover	Mayor H. C. Tuttle	14	Waterways very important to town's economy. There are extensive City and State recreational areas along Cocheco, Bellamy & Piscataqua Rivers & Little Bay. City has appointed committee to assist Corps in study. There are 4 marinas or boat-yards within city limits.

APPENDIX A (Cont'd)

No.	Individual or Agency	Represented at Hearing by	See Exhibit No.	Digest of Expressed Views
21	City (Dover) Council's Pollution Abatement Comm.	J. Maglaras	14	At a total est. cost of 4½ million the City within about 3 yrs will complete sewage work which will greatly improve present pollution of Bellamy & Cocheco Rivers. City can provide required public landings.
22	Dover Chamber of Commerce	J.H. McAdam, Exec. Secretary	14	C of C has a Great Bay Comm. to assist in the planned development of G. B. for recreation, has numerous studies & reports on subject.
23	Dover Economic Comm.	C.E. Chase, Director	14	Stresses recreational growth as vital to area.
24	Dover Planning Board	A. J. Dubois	14	Board will coordinate various City Comm. help to Corps, they have & will furnish to Corps numerous Planning Reports pertinent to Corps study.
25	Town of Durham	Sel. H. Davis	--	Town owns 3 public landings at Oyster R, 1 at Great Bay.
26	Town of Durham	F.G. Hochgraf	15	Refer to Oyster R. - requests channel marking & basin dredging of head of river. Submitted comprehensive exhibit on desired improvements, pres. navigation difficulties, pres. navigation facilities, pres. river use, storm damages, probable local cooperation.

APPENDIX A (Cont'd)

No.	Individual or Agency	Represented at Hearing by	See Exhibit No.	Digest of Expressed Views
-	Town of Durham (Henry A. Davis) (Ch'n, Board Sel.)	--	27	Requests Oyster R. channel dredging to head of navigation & Crommet Cr. channel dredging to bridge. Town has recently completed sewer work.
27	Councilman A. Corriveali, Rochester City Council, also rep. Mayor R. Edgerly		-	Waterways in study area should be developed for navigation, recreational & commercial uses. City plans to spend nearly 3½ million in near future on cleaning the Cocheco and Salmon Falls R.
28	So. Berwick Board of Select. & Town Mgr. L.W. Pomerleau	--	16	Supports any improvements for small boat navigation in Town's waterways.
29	Newington Board of Select.	--	17	Town has 20-yr comprehensive plan for all land & waters. Has lost over ½ the town's land to Fed. Gov., will oppose any further land takings. Do not want Fed. or State aid. Approve any channel improvements but opposes any changes in town's shoreline.
30	Newmarket Board of Select.	--	18	Requests dredging channel in Lamprey R. Town has public landing.
31	N.H. Marine Fisheries Assoc. T. Binmore		--	Requests channel improvements in Great Bay.

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APPENDIX A (Cont'd)

No.	Individual or Agency	Represented at Hearing by	See Exhibit No.	Digest of Expressed Views
32	Mr. Carlton Eldridge, Stratham	Himself	--	Refer Essex R - channel is tortuous but sufficiently deep for small boat navigation, however, highway & railroad bridges should maintain their draw bridge facilities to improve river navigation.
33	Mr. Aaran Davenport	"	--	Refer Essex R - channel constantly shifting, difficult to mark, railroad bridge is too low when draw not operating.
34	Mr. G. N. Weeks, Greenland	"	19	Refer Great Bay - There are 2 public and 3 private landings along 6 miles of shore within town, also 62 summer cottages. Believes mud flats along their shore does not warrant dredging. Is a strong believer in home rule and believes various Town Planning Boards should determine how the bay shore should be developed. Opposes State or Federal aid (funds). Opposes any damming of Great Bay. Believes towns-people want no changes.
35	17 Greenland residents and/or property owners	--	19A	Refer Great Bay - Opposed to any changes. Believe any changes might adversely effect game, shellfishing & marine fisheries. Area should be preserved as is and not commercialized.

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APPENDIX A (Cont'd)

No.	Individual or Agency	Represented at Hearing By	See Exhibit No.	Digest of Expressed Views
36	W. R. Weeks, Greenland	--	19B	Refer Great Bay - Owns 18 summer cottages along shores. Opposes any work along Town's shore, opposes any damming of Bay and any State or Federal agency getting controlling interest in Bay.
37	Frank W. & Ella H. Richards, Greenland	--	19C	Refer Great Bay - Opposes "any Federal Land Grab", suggests any improvement be handled at County or Town level with access to Federal aid.
38	Great Bay Waterfowl Assoc. Inc.	--	19D	Refer Great Bay - Opposed to any changes, particularly dredging, wants bay left as is, suggests putting undeveloped shore in public trust.
39	Everett P. Holland	--	19E	Refer Great Bay - Opposed to any changes.
40	E. W. Putney, Col., U.S.A. Ret.	--	20	Protests dumping of debris in vicinity of Cedar Pt., also dumping of three trunk into Cocheco R. by City of Dover. Requests marking of rock at mouth of Oyster R.
41	F. G. Hochgraf, Durham	Himself	25	Est. min channel depths of 4½ ft and believes this is adequate for small boating. Believes essential navigation need is for aids to navigation. Lists various navigation obstructions and suggests type of aid.

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APPENDIX A (Cont'd)

No.	Individual or Agency	Represented at Hearing by	See Exhibit No.	Digest of Expressed Views
42	David N. Allan	Himself	--	Stressed possible harm to marine fisheries and wildlife by any dredging operations.
43	Exeter Sportsmens Club	--	22	Refer Great Bay & Squamscott R. - heartily favor improvement of Great Bay Suggest additional boat launching points in Great Bay & operation of draw at railroad bridge over Squamscott R.
44	Exeter Board of Selectmen	--	23	Town favors any improvement for recreational boating that will not be harmful to fish and wildlife resources. Town plans in near future to construct boat launching & landing site on Squamscott R. Town is in process of completing abatement of pollution in river.
45	Durham Conservation Comm.	--	26	Concerned with future development of lands bordering the Bays. Request they be informed of each step in our study progress. Requests minimum changes in characteristics of Bays, cautions that improvement might be harmful to fish and wildlife.

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APPENDIX B

DRAFT OF REPORT OF FISH & WILDLIFE SERVICE

September 29, 1969

Division Engineer  
New England Division  
U. S. Army Corps of Engineers  
424 Trapelo Road  
Waltham, Massachusetts

Dear Sir:

This is our conservation and development report on your study of navigation improvements for Great and Little Bays, Piscataqua River and their tributaries, Rockingham and Strafford Counties, New Hampshire, and York County, Maine.

The study is made under authority of a Resolution adopted by the House Committee on Public Works on June 24, 1965, and with Section 304 of the River and Harbor Act approved on October 27, 1965. This report was prepared under authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-666 inc.), in cooperation with the New Hampshire Fish and Game Department, the Maine Department of Inland Fisheries and Game, and the Maine Department of Sea and Shore Fisheries. (Comments to be inserted).

We understand that consideration has been given to navigation improvements including berthing areas and access channels in Great and Little Bays. Major tributaries included under the study were the Bellamy, Cocheco, Exeter, Lamprey, Oyster, and Piscataqua Rivers. We further understand that your report will recommend no Federal navigation improvements at this time.

Great Bay is one of the largest estuarine areas in the Northeast. It sustains significant sport fisheries, commercial fisheries and wildlife resources.

Because of the importance of the estuarine resources in these bays, we would appreciate early notification of any navigation studies that maybe authorized at some future date. An early notice will enable us to fully coordinate our studies with yours from the start, thus enhancing the possibilities of resolving any problems that may arise in this area of valuable resources.

Sincerely yours,

APPENDIX C

STATE OF NEW HAMPSHIRE  
DEPARTMENT of RESOURCES and ECONOMIC DEVELOPMENT



STATE HOUSE ANNEX . . . . . CONCORD, NEW HAMPSHIRE  
TELEPHONE - CAPITOL 5-6611

Office of the Commissioner

October 14, 1969

Frank P. Bane, Colonel  
Corps of Engineers  
Division Engineer  
424 Trapelo Road  
Waltham, Massachusetts

Dear Col. Bane:

This will respond to your letter of 23 September regarding a Navigation Survey Study of the Great Bay Area of New Hampshire and Maine.

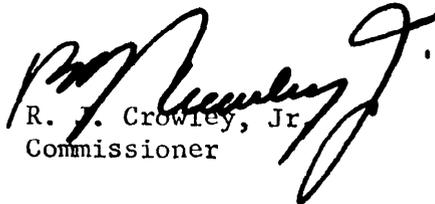
I would appreciate receiving a copy of your completed Navigation Survey Study of the Great Bay Area.

At the present time, the State of New Hampshire does not have funds for docking and launching facilities available for construction in the area under study.

Accordingly, the State of New Hampshire does not interpose an objection to your proposed report and recommendation to the Congress that navigation improvements in this area are not unwarranted at this time.

However, the State of New Hampshire does reserve the right to request the Corps of Engineers to reconsider this matter at such time as funds are available to remedy the deficiencies outlined in your letter.

Sincerely,

  
R. J. Crowley, Jr.  
Commissioner

RJC/dw

cc: Malcolm Chase  
Mary Louise Hancock



APPENDIX C

# MAINE PORT AUTHORITY



MAINE STATE PIER • PORTLAND, MAINE 04111 • TEL. 773-5608

A. EDWARD LANGLOIS, JR.  
GENERAL MANAGER

October 2, 1969

Colonel Frank P. Bane  
U.S. Army Corps of Engineers  
424 Trapelo Road  
Waltham, Massachusetts

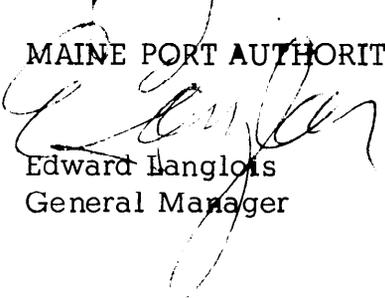
Dear Colonel Bane:

This is in response to your letter of 23 September 1969 requesting our comments on the Corps report on the navigation survey study of the Great Bay area in New Hampshire and Maine.

I have discussed this with Mr. George Taylor, of the Maine Department of Sea and Shore Fisheries and in view of your lengthy study and our personal conversations with members of your staff in regard to this project, we take no objection to your tentative findings and recommendations.

Sincerely yours,

MAINE PORT AUTHORITY

  
Edward Langlois  
General Manager

EL/lg  
cc: George Taylor

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WILLIAM C. AVERY, TREASURER  
J. C. O'CONNELL, SUPERINTENDENT

DIRECTORS  
RICHARD F. KILROY, CAPE ELIZABETH, PRES.

JAMES G. SAWYER, CASTINE  
DONALD R. SLIPP, PORTLAND

GREAT AND LITTLE BAYS  
THEIR TRIBUTARIES AND ADJOINING TRIBUTARIES  
OF THE PISCATAQUA RIVER  
NEW HAMPSHIRE-MAINE

Information called for by Senate Resolution 148, 85th Congress,  
1st Session, Adopted 28 January 1958

1. The information in this supplement is furnished in response to the above Senate Resolution which calls for data in addition to that presented in the report in support of any project recommended for authorization and on possible alternatives thereto.

2. Discussion. The Division Engineer, after due consideration to the requests by local interests for navigation improvements, finds that improvements to the area's waterways are neither necessary or justified at this time. He therefore makes no recommendations for any improvement project in the area.