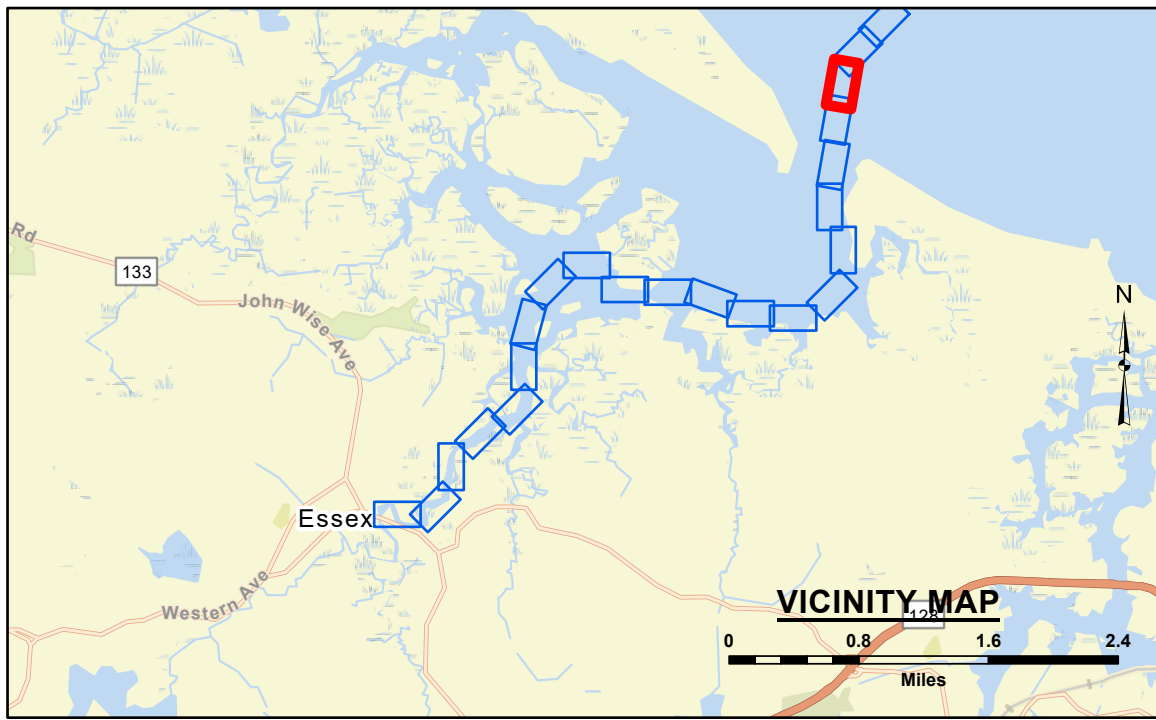




LEGEND

Channel Center Line

Marine Infrastructure*

.....

Cable or Pipeline Area

—

Contour Line

⊗

Obstruction Point

⊗

Fixed Navigation Aids

!

Red Navigation Buoy

!

Green Navigation Buoy

!

Navigation Buoy

■

Shoaling Area

●

Shoalest Sounding**

1" = 50'

GRAPHIC SCALE

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach
* Present at Time of Survey

Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 KHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

The information depicted on these charts represents the results of surveys made on the dates indicated, and can only be considered as indicating the conditions existing at that time.

General Notes
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**US Army Corps
of Engineers**
District: CENAE

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT		SURVEYED BY: MJO	
SUBMITTED BY: Zachary McAvoy		CHECKED BY: WHW	
APPROVED BY: NAE Survey		ISSUE DATE: 3/7/2025	
SIZE: ANSI D	MAP DOCUMENT: MA_04_ESS_20250225_AD_003		

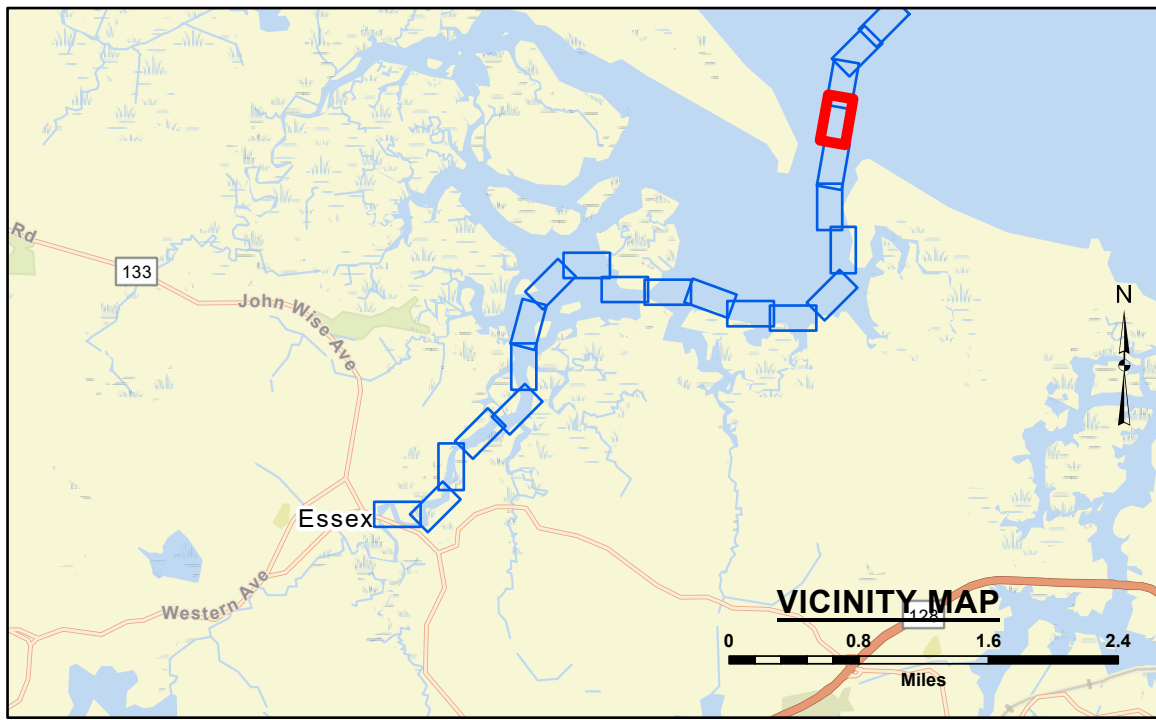
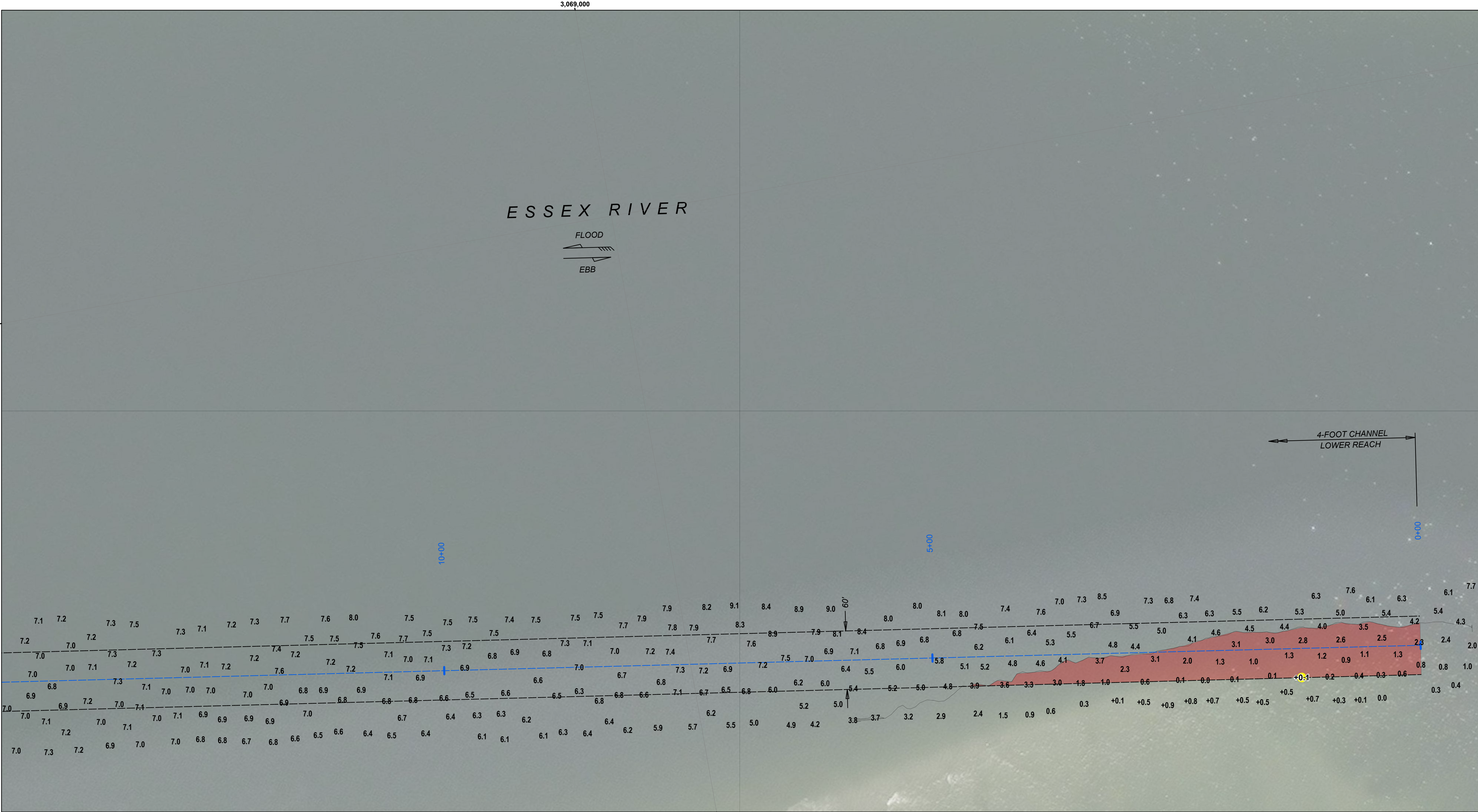
**ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY**

**4-FOOT CHANNEL AND
4-FOOT TURNING BASIN**

File Name: MA_04_ESS_20250225_AD_003

**SHEET
IDENTIFICATION
Essex River**

Sheet 3 of 22



LEGEND

--- Federal Navigation Channel

--- Channel Center Line

--- Marine Infrastructure*

..... Cable or Pipeline Area

— Contour Line

⊗ Obstruction Point

⊗ Fixed Navigation Aids

! Red Navigation Buoy

! Green Navigation Buoy

! Navigation Buoy

■ Shoaling Area

● Shoalest Sounding**

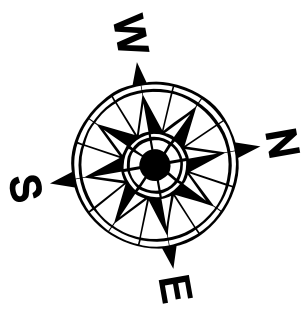
GRAPHIC SCALE

1" = 50'

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach

* Present at Time of Survey



Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 KHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

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US Army Corps of Engineers
District: CENAE

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT	SURVEYED BY: MJO	CHECKED BY: WHW	ISSUE DATE: 3/7/2025
	SUBMITTED BY: Zachary McAvoy	APPROVED BY: NAE Survey	MAP DOCUMENT MA_04_ESS_20250225_AD_003
SIZE A1SD		FILE NAME: MA_04_ESS_20250225_AD_003	

ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

4-FOOT CHANNEL AND
4-FOOT TURNING BASIN

File Name: MA_04_ESS_20250225_AD_003

SHEET
IDENTIFICATION
Essex River

Sheet 4 of 22



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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT		SUBMITTED BY: Zachary McAvoy _____ APPROVED BY: NAE Survey _____	SURVEYED BY: MJO _____ CHECKED BY: WHW _____
SIZE: ANSI D	MAP DOCUMENT: MA_04_15SG_Z0302020_003 ISSUE DATE: 3/7/2025		

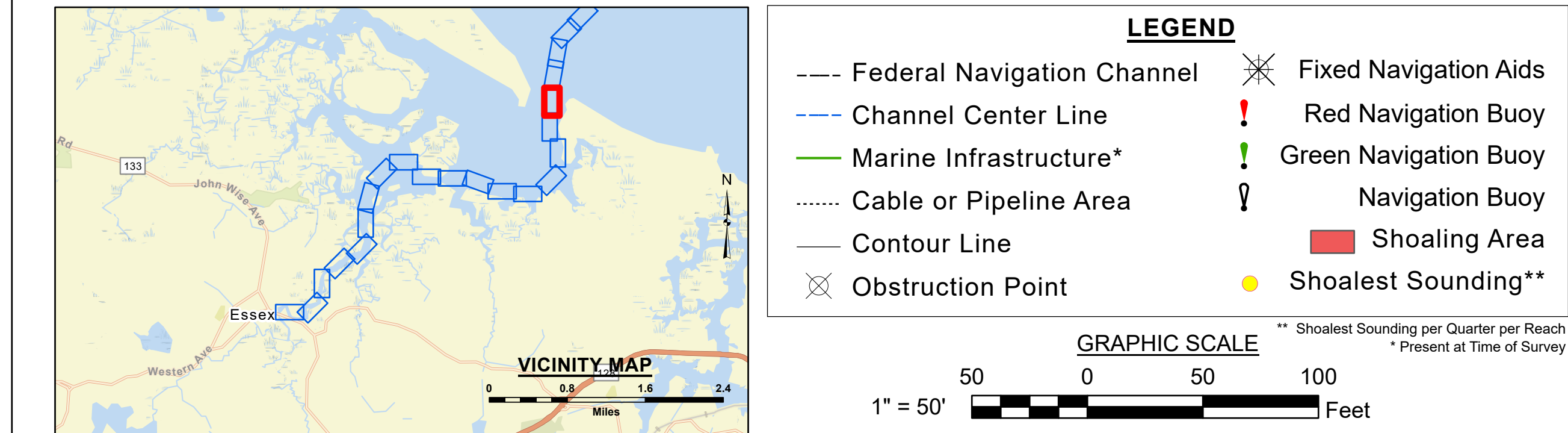
ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

4-FOOT CHANNEL AND
4-FOOT TURNING BASIN

File Name: MA_04_ESR_20250225_AD_003

**SHEET
IDENTIFICATION**
Essex River

Sheet 5 of 22



Notes:

Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 kHz
Sounder Method: RTPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

The information depicted on these charts represents the results of surveys made on the dates indicated, and can only be considered as indicating the conditions existing at that time.

General Notes

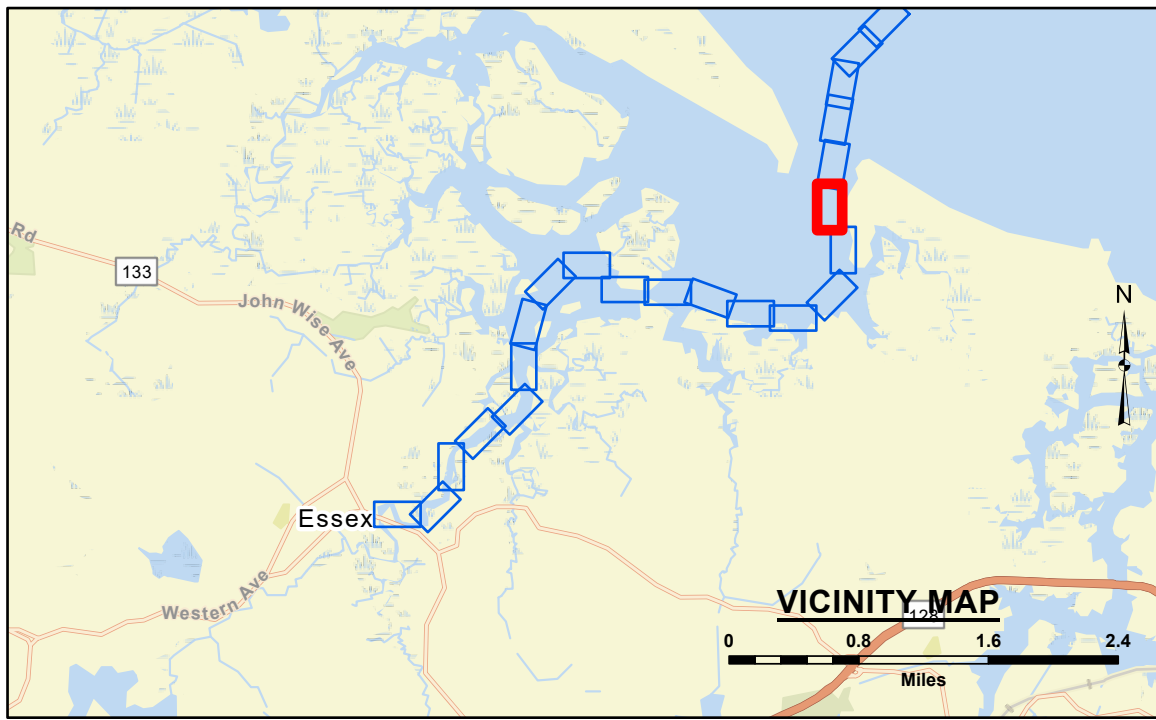
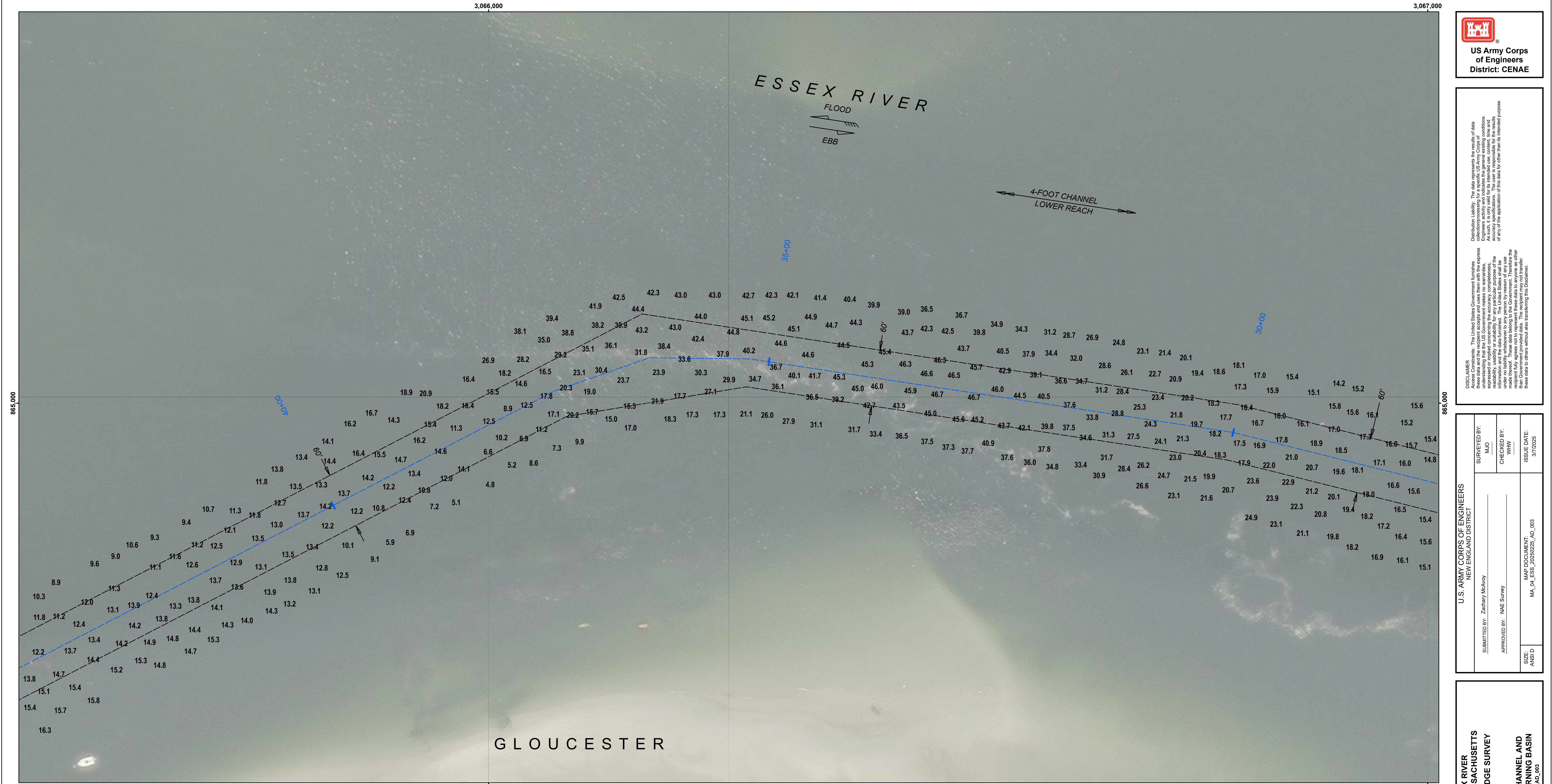
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Project Remarks

Survey includes investigation route adjacent to and between stations 90+00 and 125+00 of the Federal Navigation Project (FNP) areas of dynamic shoal movement, rock, hard material and pilings present during dredging.

Water Level Information

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LEGEND

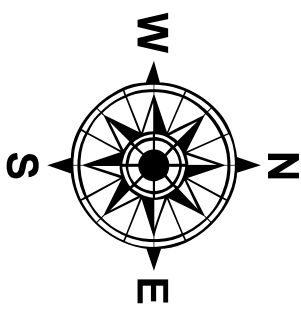
- Federal Navigation Channel
- - - Channel Center Line
- Marine Infrastructure*
- Cable or Pipeline Area
- Contour Line
- ⊗ Obstruction Point
- ⊗ Fixed Navigation Aids
- ! Red Navigation Buoy
- ! Green Navigation Buoy
- ⚓ Navigation Buoy
- Shoaling Area
- Shoalest Sounding**

GRAPHIC SCALE

1" = 50'

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach
* Present at Time of Survey



Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 KHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

The information depicted on these charts represents the results of surveys made on the dates indicated, and can only be considered as indicating the conditions existing at that time.

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT		SURVEYED BY: MJO		CHECKED BY: WHW		ISSUE DATE: 3/7/2025	
SUBMITTED BY: Zachary McAvoy		APPROVED BY: NAE Survey		FILE NAME: MA_04_ESS_20250225_AD_003		SIZE: 415 KB	

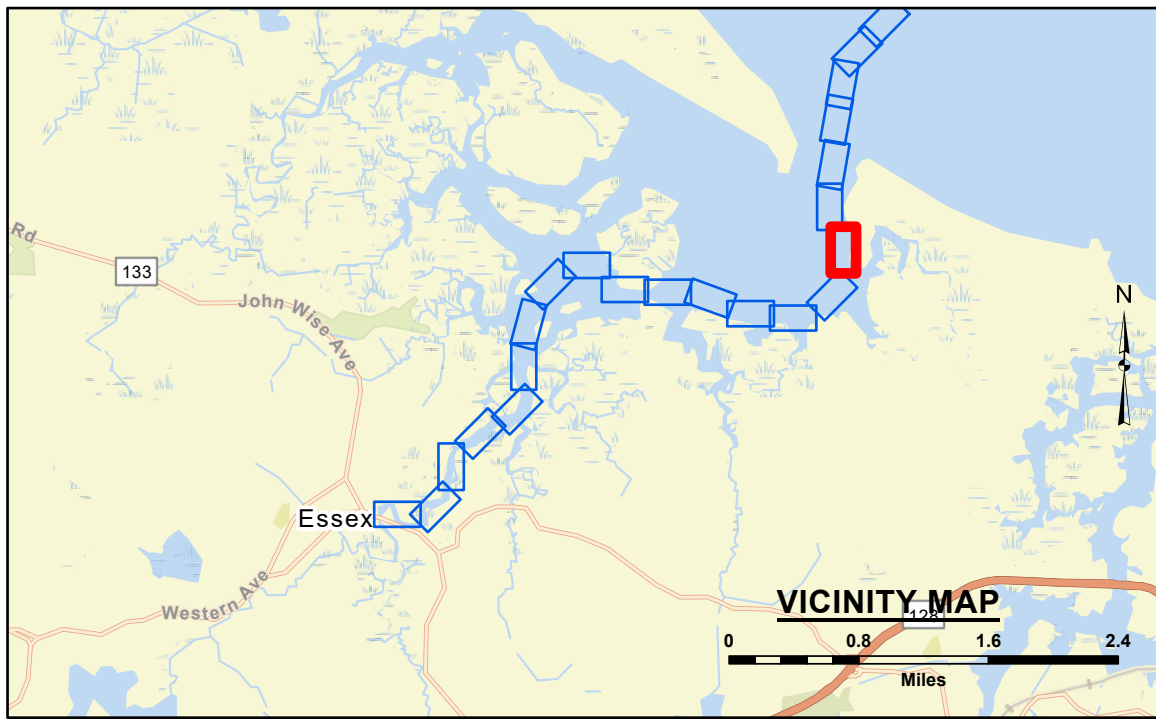
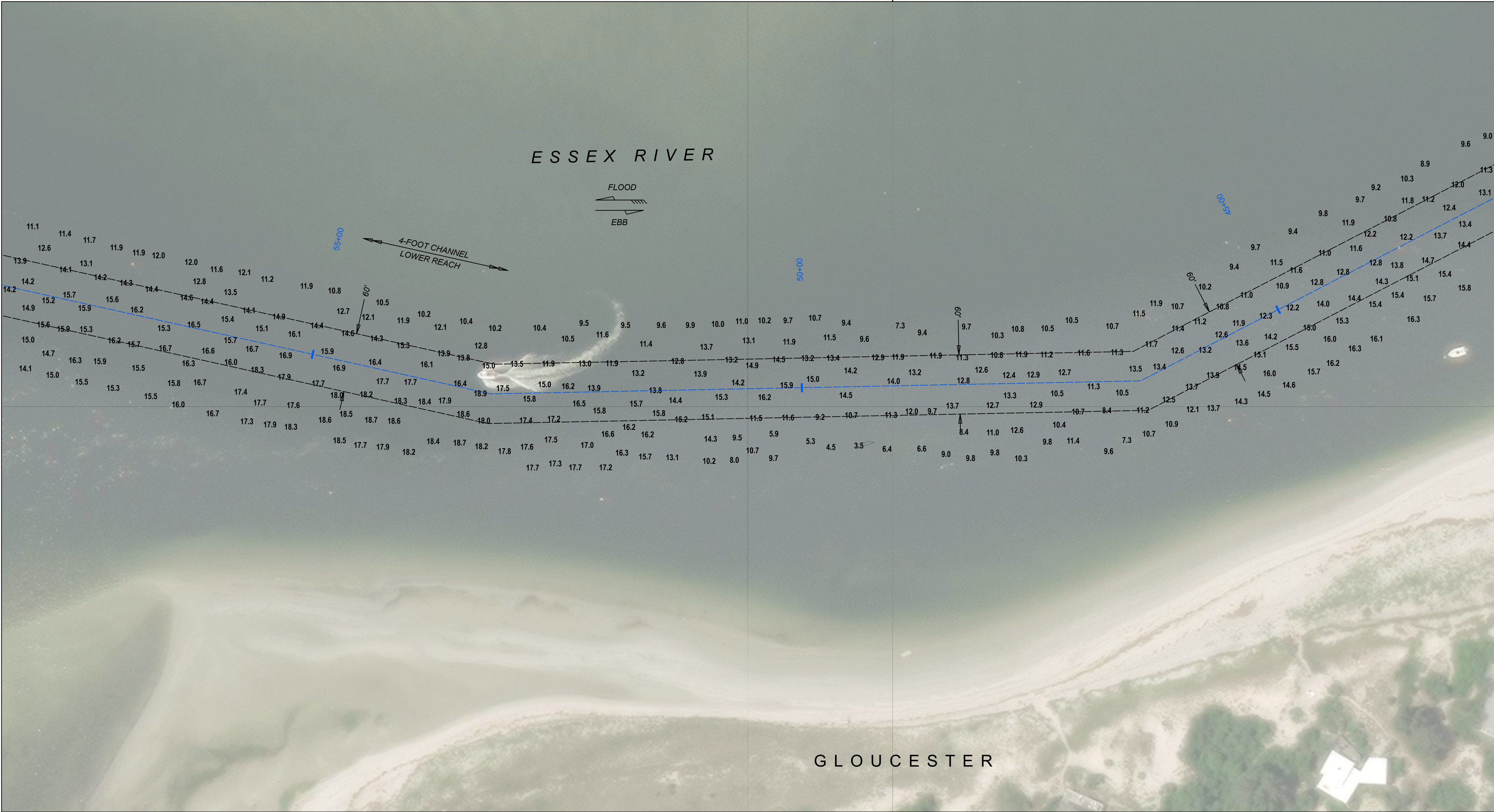
**ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY**

**4-FOOT CHANNEL AND
4-FOOT TURNING BASIN**

File Name: MA_04_ESS_20250225_AD_003

**SHEET
IDENTIFICATION
Essex River**

Sheet 6 of 22



LEGEND

--- Federal Navigation Channel

--- Channel Center Line

--- Marine Infrastructure*

..... Cable or Pipeline Area

--- Contour Line

⊗ Obstruction Point

⊗ Fixed Navigation Aids

! Red Navigation Buoy

! Green Navigation Buoy

! Navigation Buoy

■ Shoaling Area

● Shoalest Sounding**

GRAPHIC SCALE

1" = 50'

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach

* Present at Time of Survey

Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 KHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

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US Army Corps of Engineers
District: CENAE

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT			
SUBMITTED BY: Zachary McAvoy		SURVEYED BY: MJO	
APPROVED BY: NAE Survey		CHECKED BY: WHW	
SIZE: ANSI D	MAP DOCUMENT: MA_04_ESS_20250225_AD_003		ISSUE DATE: 3/7/2025

ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

4-FOOT CHANNEL AND
4-FOOT TURNING BASIN

File Name: MA_04_ESS_20250225_AD_003

SHEET
IDENTIFICATION
Essex River

Sheet 7 of 22



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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT		SUBMITTED BY: Zachary McAvoy APPROVED BY: NAE Survey	SURVEYED BY: MJO CHECKED BY: WHW
SIZE: ANSI D	MAP DOCUMENT: MA_04_15SG_240302020_003		
ISSUE DATE: 3/7/2025			

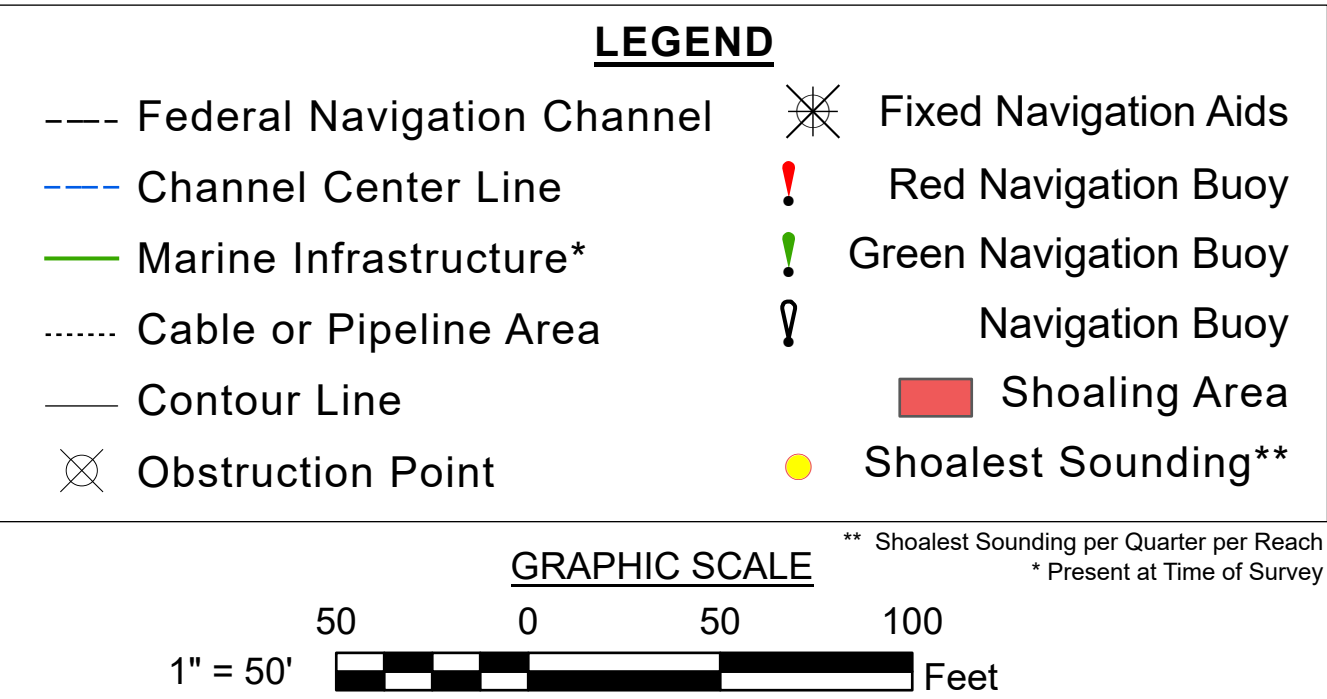
ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

4-FOOT CHANNEL AND
4-FOOT TURNING BASIN

File Name: MA_04_ESR_20250225_AD_003

**SHEET
IDENTIFICATION**
Essex River

Sheet 8 of 22



Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 kHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reference (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Direction: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20202225_AD_003
Reference NOAA Chart No.: ENC US4M40M, US4M403M

The information depicted on these charts represents the results of surveys made on the dates indicated, and can only be considered as indicating the conditions existing at that time.

General Notes

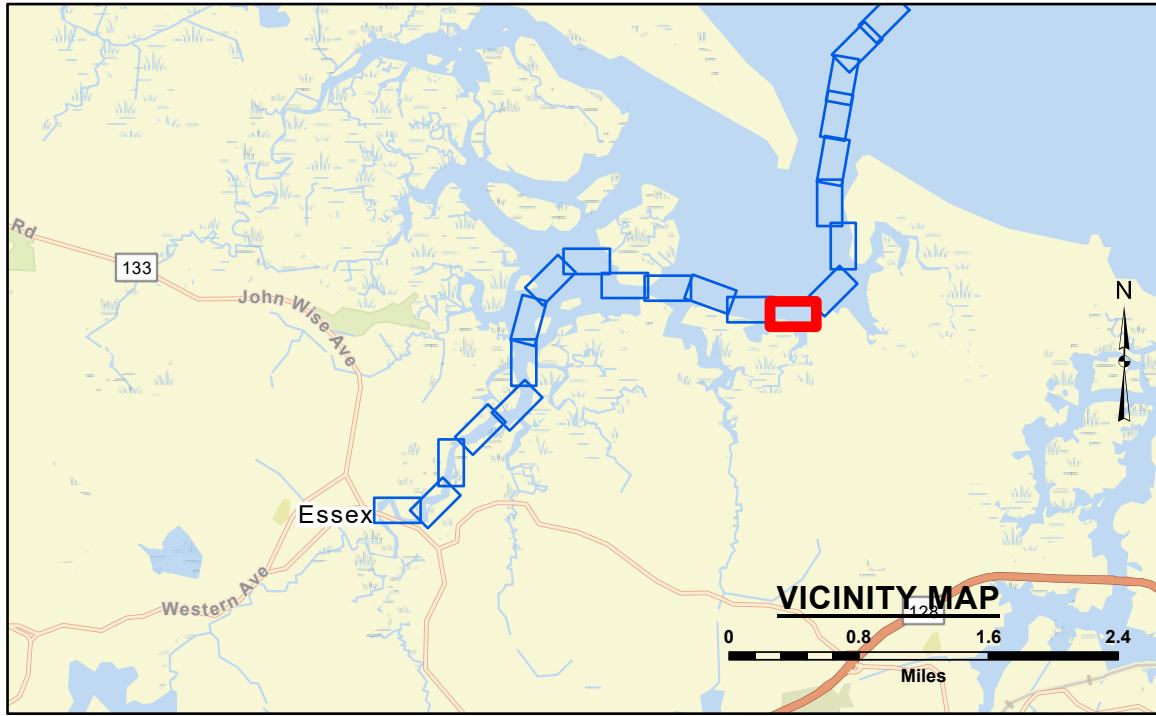
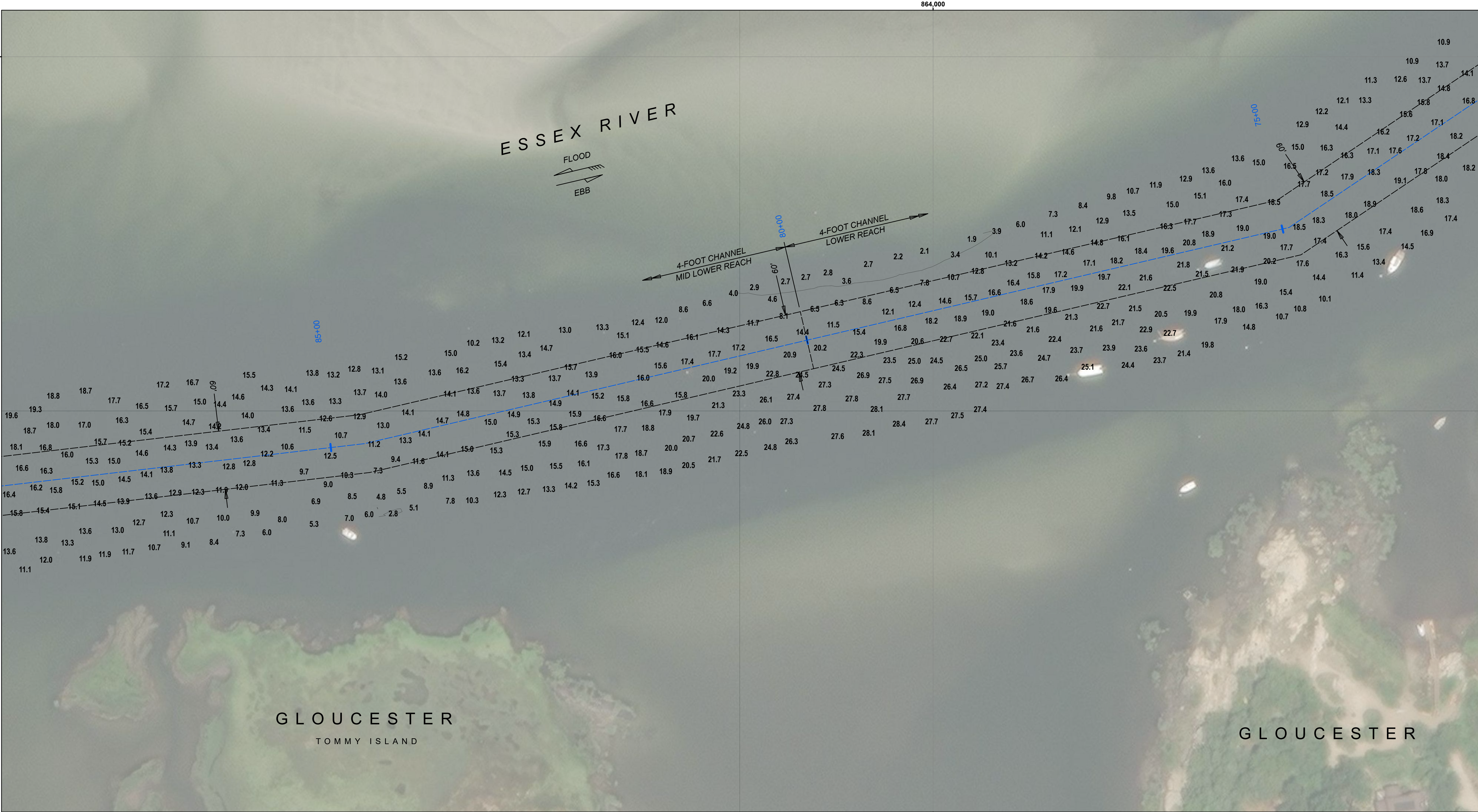
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LEGEND

--- Federal Navigation Channel

--- Channel Center Line

--- Marine Infrastructure*

..... Cable or Pipeline Area

— Contour Line

⊗ Obstruction Point

⊗ Fixed Navigation Aids

! Red Navigation Buoy

! Green Navigation Buoy

⚓ Navigation Buoy

■ Shoaling Area

● Shoalest Sounding**

GRAPHIC SCALE

1" = 50'

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach
* Present at Time of Survey

Notes:

Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 kHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

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US Army Corps of Engineers
District: CENAE

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT	SURVEYED BY: MJO	MA_04_ESS_20250225_AD_003
	CHECKED BY: WHW	
	ISSUE DATE: 3/7/2025	
SIZE A1 STD		

**ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY**

**4-FOOT CHANNEL AND
4-FOOT TURNING BASIN**

File Name: MA_04_ESS_20250225_AD_003

**SHEET
IDENTIFICATION
Essex River**

Sheet 9 of 22



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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT		SUBMITTED BY: Zachary McAvoy APPROVED BY: NAE Survey	SURVEYED BY: MJO CHECKED BY: WHW	ISSUE DATE: 3/7/2025
SIZE: ANSI D	MAP DOCUMENT: MA_04_15SG_Z0302025_Z0_003			

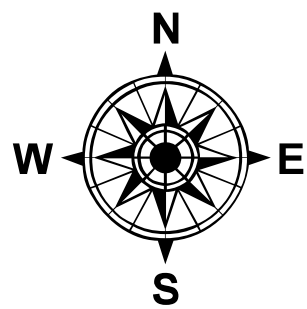
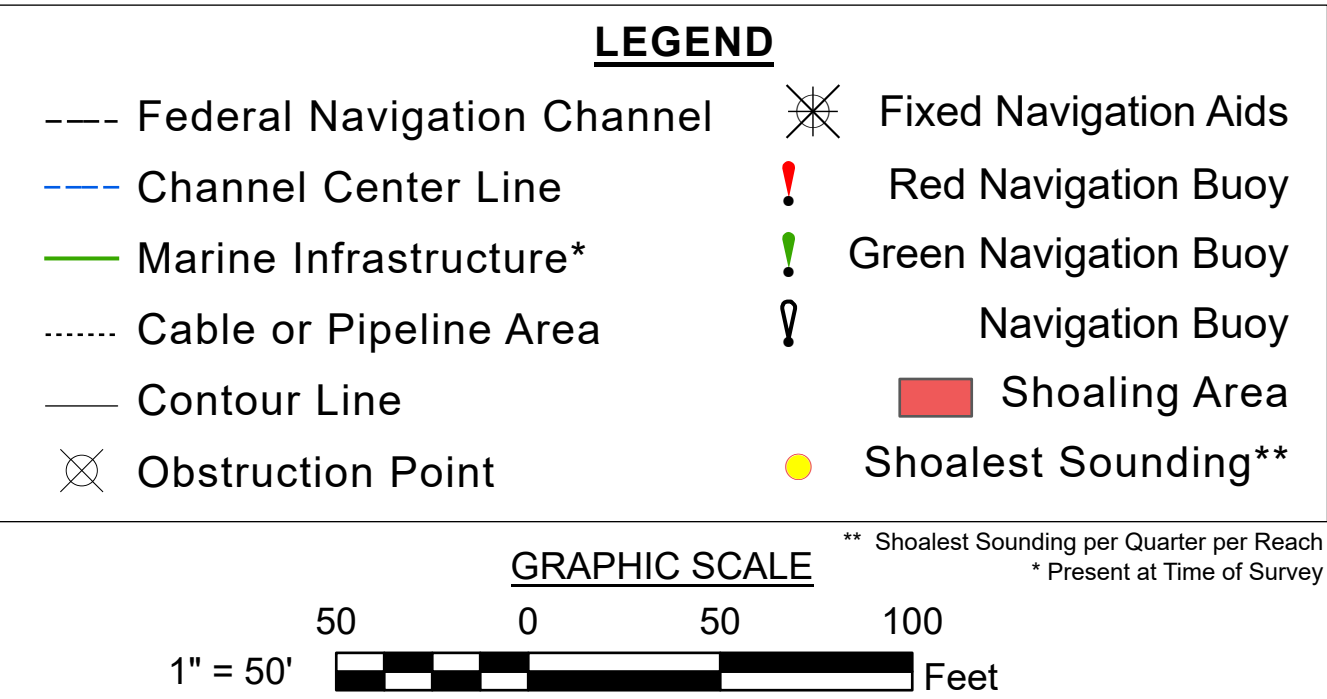
ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

4-FOOT CHANNEL AND
4-FOOT TURNING BASIN

File Name: MA_04_ESS_20250225_AD_003

**SHEET
IDENTIFICATION**
Essex River

Sheet 10 of 22



Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: FOP/Alt 85°
Sonar System: Reson TS150 MultiBeam
Sounding Frequency: 300 kHz
Survey Method: RTK GPS TIDES
GPS_System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30°
File Books: R&H Alt 85°
Survey No.: MA_04_ESS_202502225_A0_003
Reference NOAA Chart No.: ENC US4M40A04, US4M40A3M

General Notes

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Project Remarks

Survey includes investigation route adjacent to and between stations 90+00 and 125+00 of the Federal Navigation Project (FNP) areas of dynamic shoal movement, rock, hard material and pilings present during dredging.

Water Level Information

Tides were recorded using RTK GPS. NAVD88 to MLLW corrections were logged utilizing a single correction of 5.21 feet in the project area. This correction was established at Station Wine (2014). MLLW is below NAVD88; therefore, the correction should be added to NAVD88 to convert to MLLW (e.g. -10 NAV88 = -8 MLLW when using a 2-foot correction).



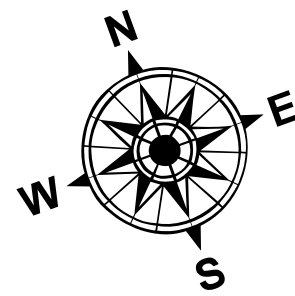
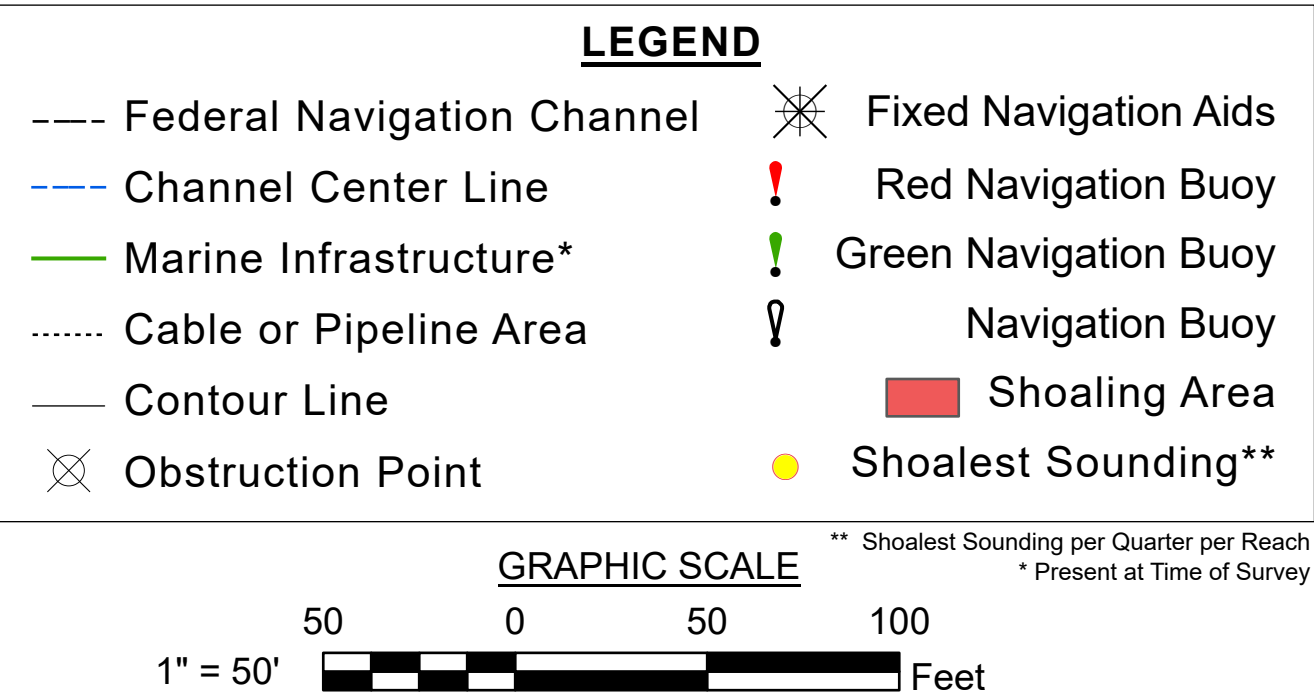
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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT		SURVEYED BY: MJO _____
SUBMITTED BY: Zachary McAvoy _____		CHECKED BY: WHW _____
APPROVED BY: NAE Survey _____		ISSUE DATE: 3/17/2025
SIZE ANSI D	MAP DOCUMENT: MA_04_1ESS_240202010_003	

ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY
4-FOOT CHANNEL AND
4-FOOT TURNING BASIN
File Name: MA_04_ESS_20250225_AD_003

**SHEET
IDENTIFICATION**
Essex River

Sheet 11 of 22



Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: PGP/ATH BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 kHz
Survey Method: RTK GPS TIDES
GPS_System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Scan Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AA_003
Reference NOAA Chart No.: ENC US44AD_A04M, US44A03M

The information depicted on these charts represents the results of surveys made on the dates indicated, and can only be considered as indicating the conditions existing at that time.

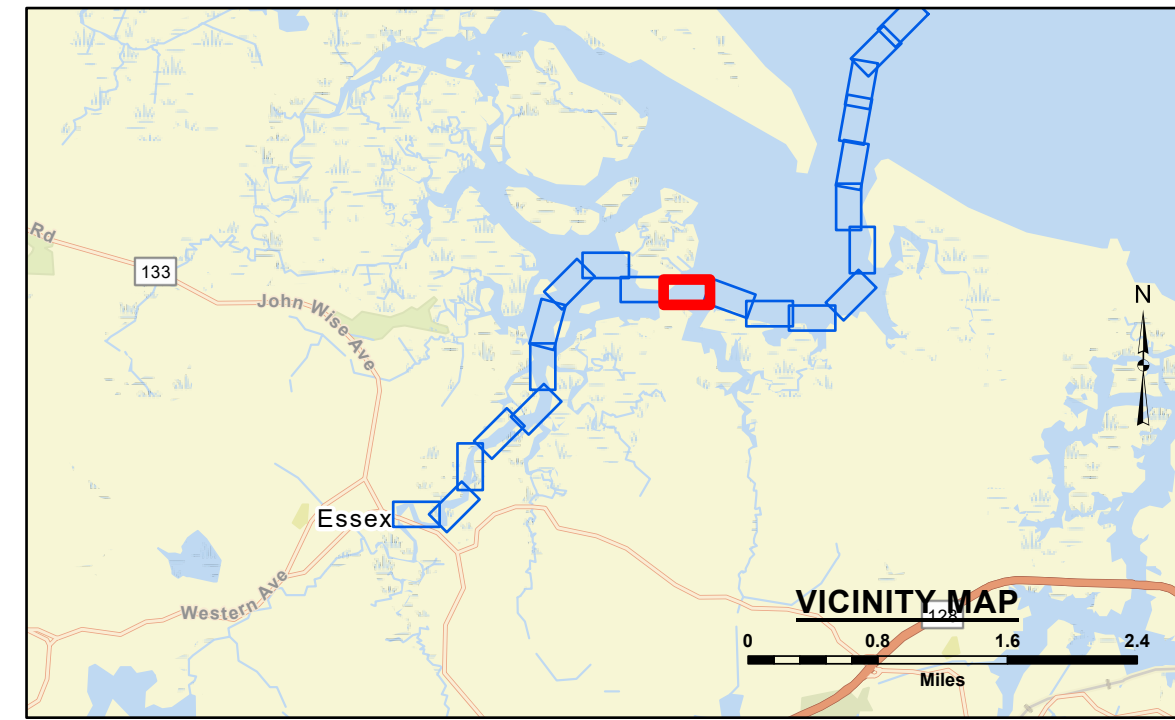
General Notes

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Project Remarks
Survey includes investigation route adjacent to and between stations 90+00 and 125+00 of the Federal Navigation Project (FNP) areas of dynamic shoal movement, rock, hard material and pilings present during dredging.

Water Level Information

Tides were recorded using RTK GPS. NAVD88 to MLLW corrections were logged utilizing a single correction of 5.21 feet in the project area. This correction was established at Station Wine (2014). MLLW is below NAVD88; therefore, the correction should be added to NAVD88 to convert to MLLW (e.g. -10 NAV88 = -8 MLLW when using a 2-foot correction).



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Project Remarks

Survey includes investigation route adjacent to and between stations 90+00 and 125+00 of the Federal Navigation Project (FNP) areas of dynamic shoal movement, rock, hard material and pilings present during dredging.

Water Level Information

Tides were recorded using RTK GPS. NAVD88 to MLLW corrections were logged utilizing a single correction of 5.21 feet in the project area. This correction was established at Station Wine (2014). MLLW is below NAVD88; therefore, the correction should be added to NAVD88 to convert to MLLW (e.g. -10 NAV88 = -8 MLLW when using a 2-foot correction).

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT	
SUBMITTED BY: Zachary McKay	SURVEYED BY: MJO
APPROVED BY: NAE Survey	CHECKED BY: WHW
SIZE ANSI D MAP DOCUMENT MA_04_ESS_020302020_003	ISSUE DATE: 1/7/2025

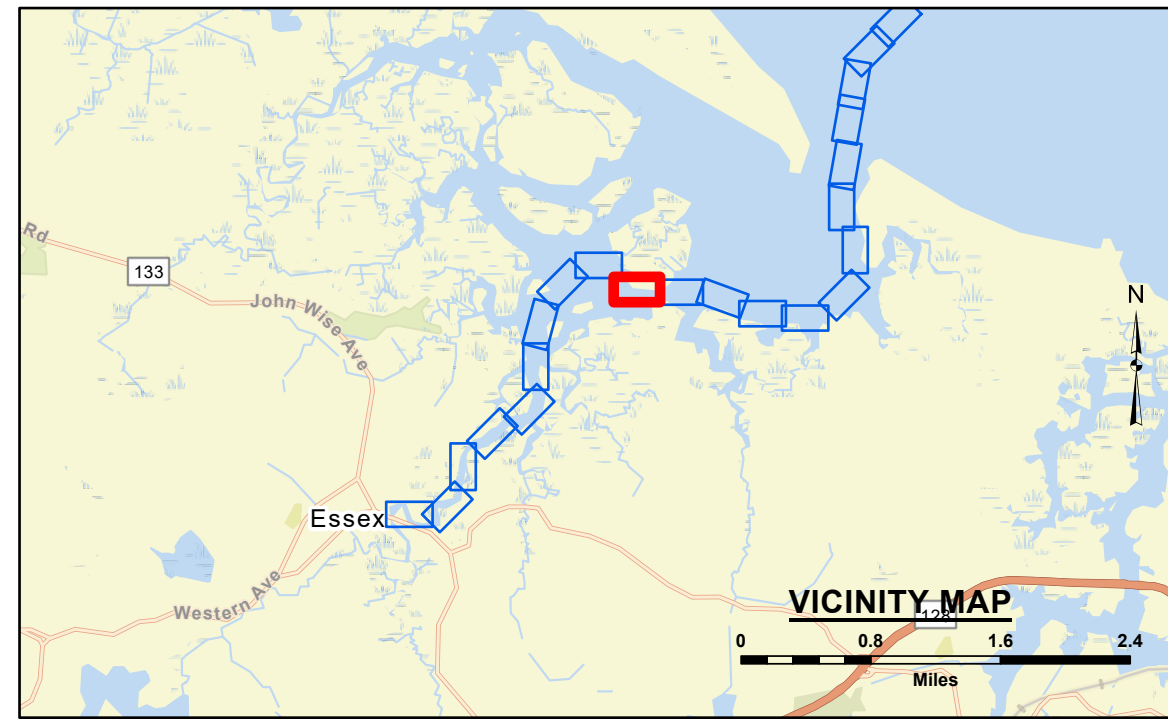
ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

4-FOOT CHANNEL AND
4-FOOT TURNING BASIN

File Name: MA_04_ESS_20260226_AD_003

**SHEET
IDENTIFICATION
Essex River**

Sheet 12 of 22



LEGEND

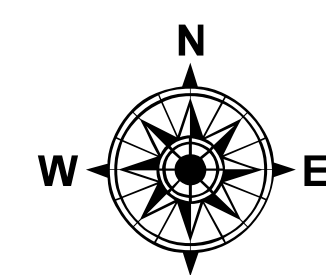
--- Federal Navigation Channel		Fixed Navigation Aids
- - - Channel Center Line		Red Navigation Buoy
— Marine Infrastructure*		Green Navigation Buoy
..... Cable or Pipeline Area		Navigation Buoy
— Contour Line		Shoaling Area
 Obstruction Point		Shoalest Sounding**

GRAPHIC SCALE

50 0 50 100

1" = 50'  Feet

** Shoalest Sounding per Quarter per Reach
* Present at Time of Survey



Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 kHz
Survey Method: RTK GPS TIDES
GPS_System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ES5_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

The information depicted on these charts represents the results of surveys made on the dates indicated, and can only be considered as indicating the conditions existing at that time.

General Notes

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Project Remarks

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Water Level Information

Tides were recorded using RTK GPS. NAVD88 to MLLW corrections were logged utilizing a single correction of 5.21 feet in the project area. This correction was established at Station Wine (2014). MLLW is below NAVD88; therefore, the correction should be added to NAVD88 to convert to MLLW (e.g., -10 NAV88 = -8 MLLW when using a 2-foot correction).



**US Army Corps
of Engineers
District: CENAE**

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT		SUBMITTED BY: Zachary McAlroy APPROVED BY: NAE Survey	SURVEYED BY: MLO CHECKED BY: WHW	ISSUE DATE: 3/7/2025
SIZE: ANSI D	MAX DOCUMENT: MA_04_ESS_CorridorZ/J_003			

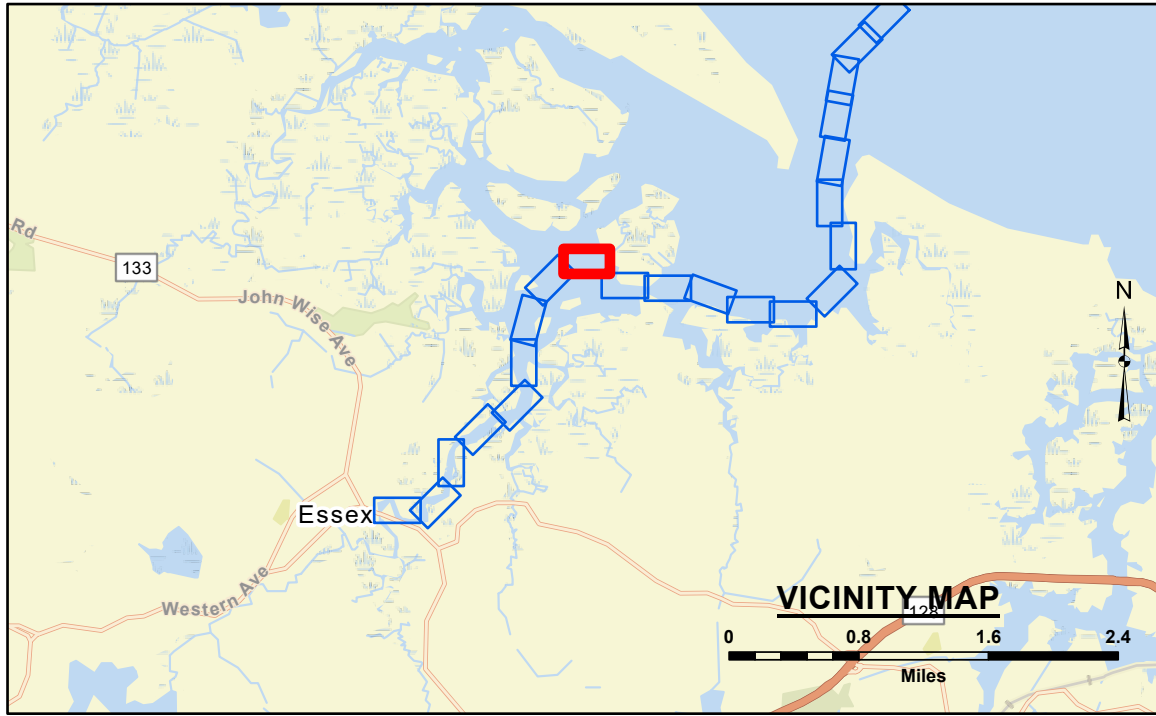
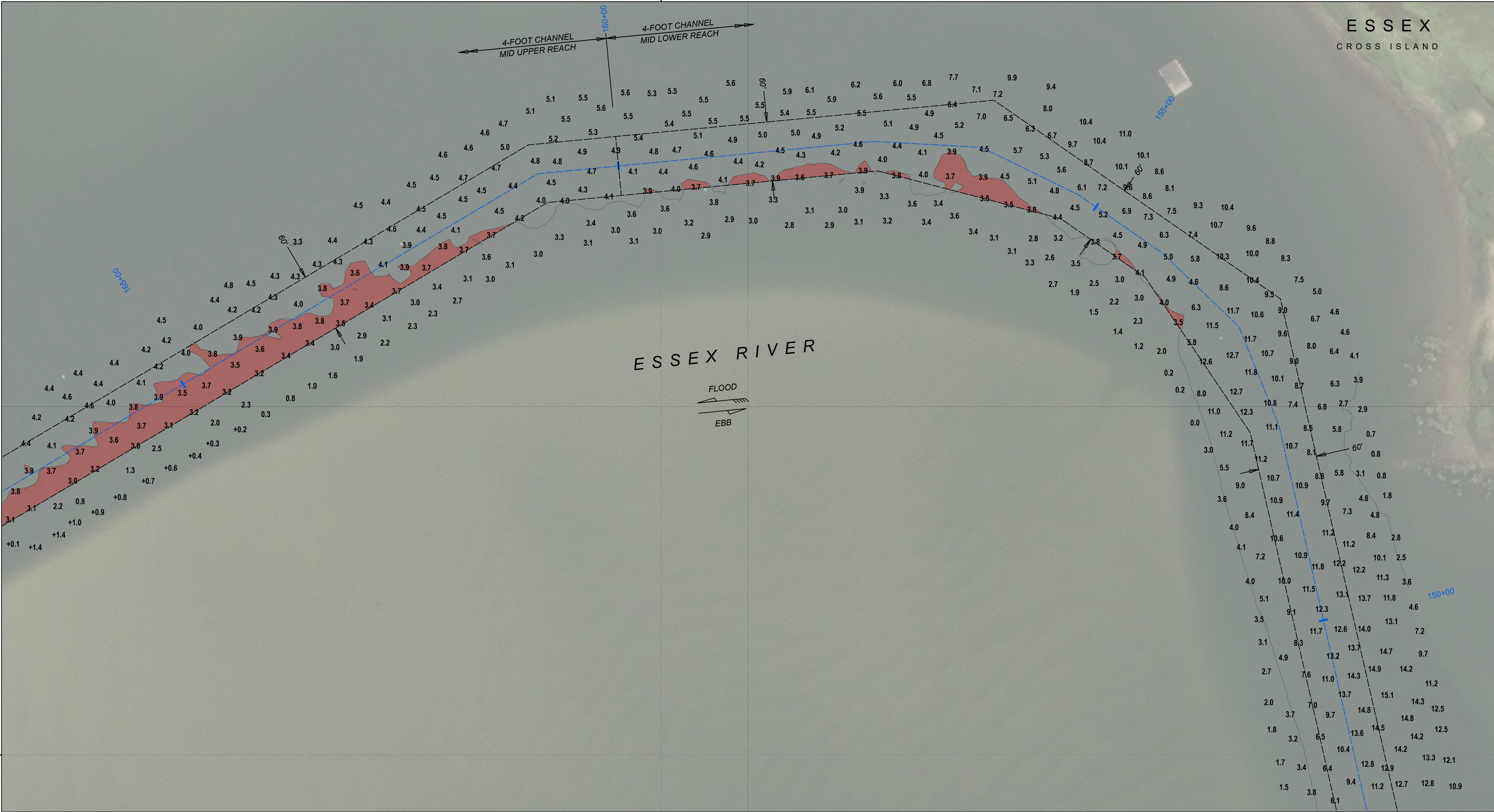
ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

4-FOOT CHANNEL AND
4-FOOT TURNING BASIN

File Name: MA_04_ESS_20509225_AD_003

**SHEET
IDENTIFICATION**
Essex River

Sheet 13 of 22



LEGEND

--- Federal Navigation Channel

--- Channel Center Line

--- Marine Infrastructure*

..... Cable or Pipeline Area

— Contour Line

⊗ Obstruction Point

⊗ Fixed Navigation Aids

! Red Navigation Buoy

! Green Navigation Buoy

⚓ Navigation Buoy

■ Shoaling Area

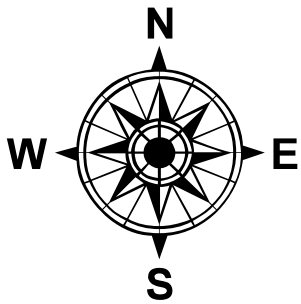
● Shoalest Sounding**

GRAPHIC SCALE

1" = 50'

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach
* Present at Time of Survey



Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 KHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

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General Notes
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Project Remarks
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Water Level Information
Tides were recorded using RTK GPS. NAVD88 to MLLW corrections were logged utilizing a single correction of 5.21 feet in the project area. This correction was established at Station Wine (2014). MLLW is below NAVD88; therefore, the correction should be added to NAVD88 to convert to MLLW (e.g. -10 NAV88 = -8 MLLW when using a 2-foot correction).



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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT	SURVEYED BY: MJO	CHECKED BY: WHW	ISSUE DATE: 3/7/2025
	SUBMITTED BY: Zachary McAvoy	APPROVED BY: NAE Survey	MAP DOCUMENT MA_04_ESS_20250225_AD_003
	SIZE A1 STD		

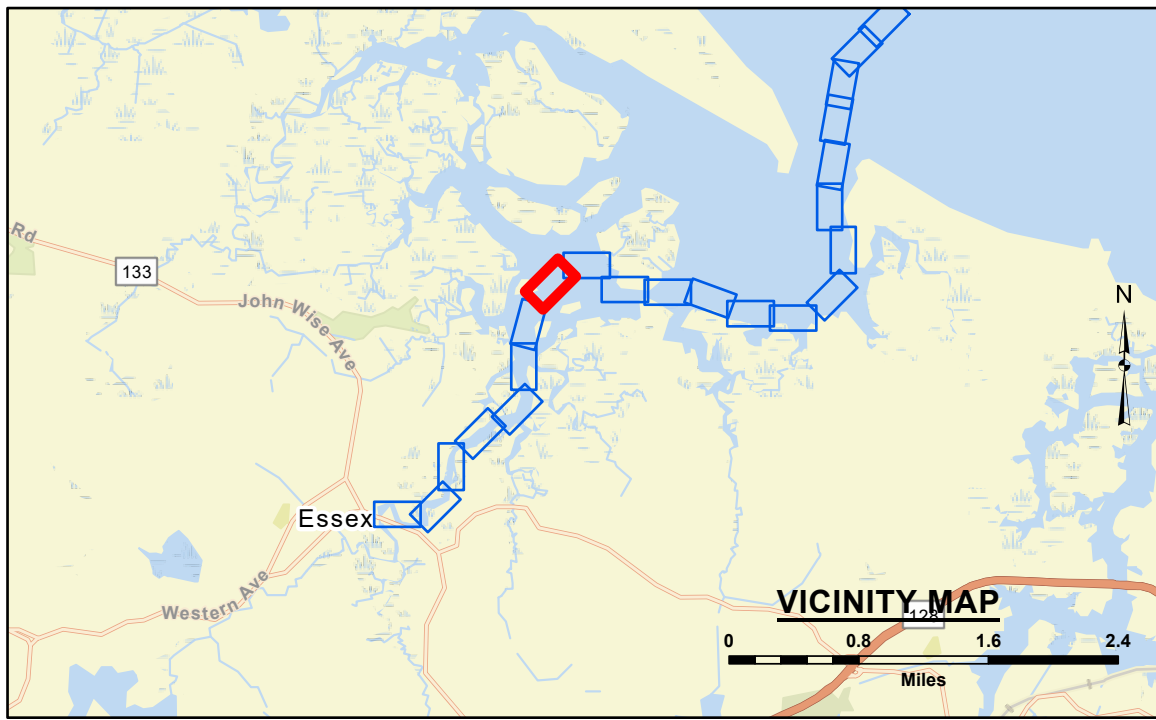
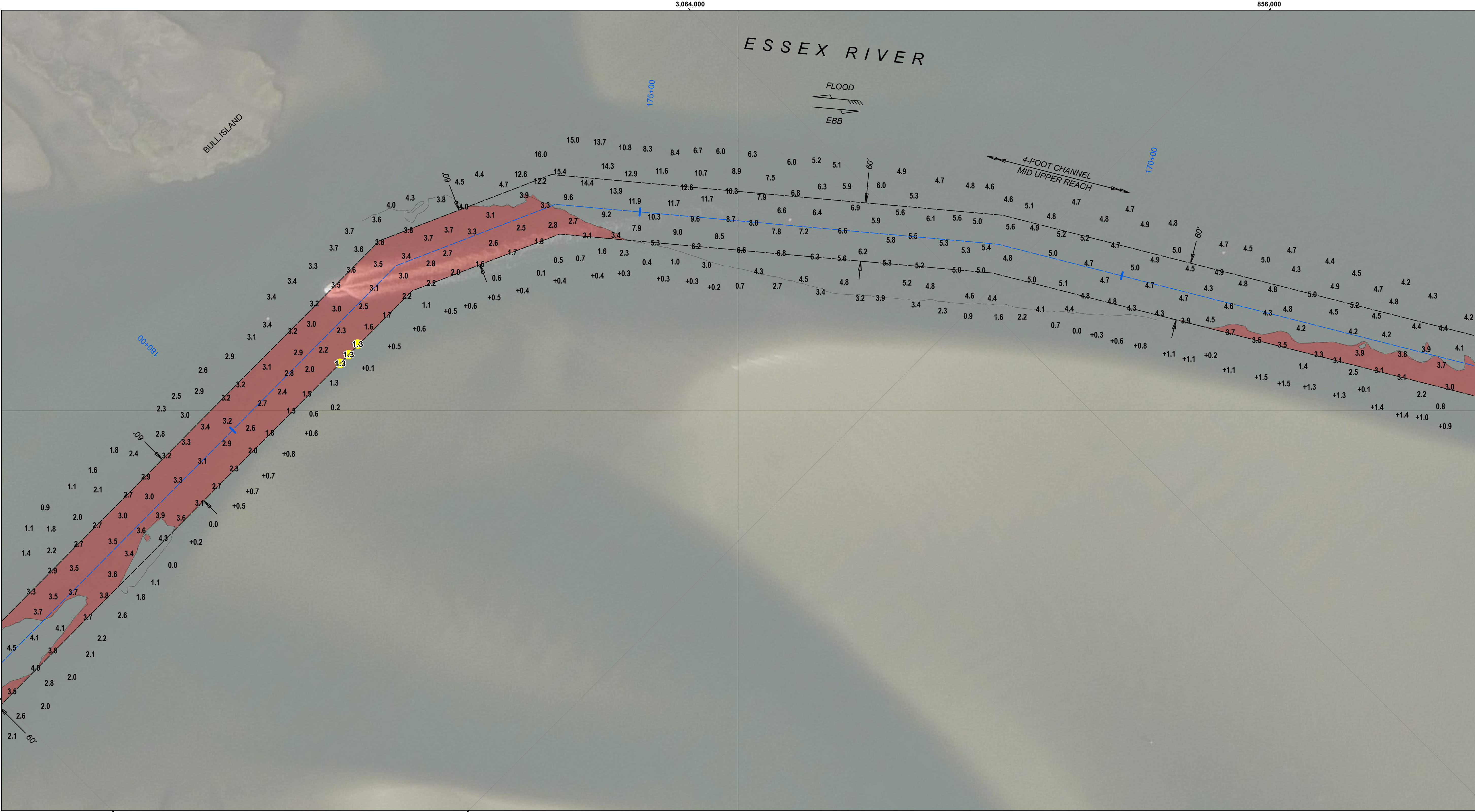
**ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY**

**4-FOOT CHANNEL AND
4-FOOT TURNING BASIN**

File Name: MA_04_ESS_20250225_AD_003

**SHEET
IDENTIFICATION
Essex River**

Sheet 14 of 22



LEGEND

--- Federal Navigation Channel

--- Channel Center Line

--- Marine Infrastructure*

..... Cable or Pipeline Area

--- Contour Line

⊗ Obstruction Point

⊗ Fixed Navigation Aids

! Red Navigation Buoy

! Green Navigation Buoy

⚓ Navigation Buoy

■ Shoaling Area

● Shoalest Sounding**

1" = 50'

GRAPHIC SCALE

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach
* Present at Time of Survey

Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 KHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

The information depicted on these charts represents the results of surveys made on the dates indicated, and can only be considered as indicating the conditions existing at that time.

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Water Level Information
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US Army Corps of Engineers
District: CENAE

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT			
SUBMITTED BY: Zachary McAvoy		SURVEYED BY: MJO	
APPROVED BY: NAE Survey		CHECKED BY: WHW	
SIZE: ANSI D	MAP DOCUMENT: MA_04_ESS_20250225_AD_003		ISSUE DATE: 3/7/2025

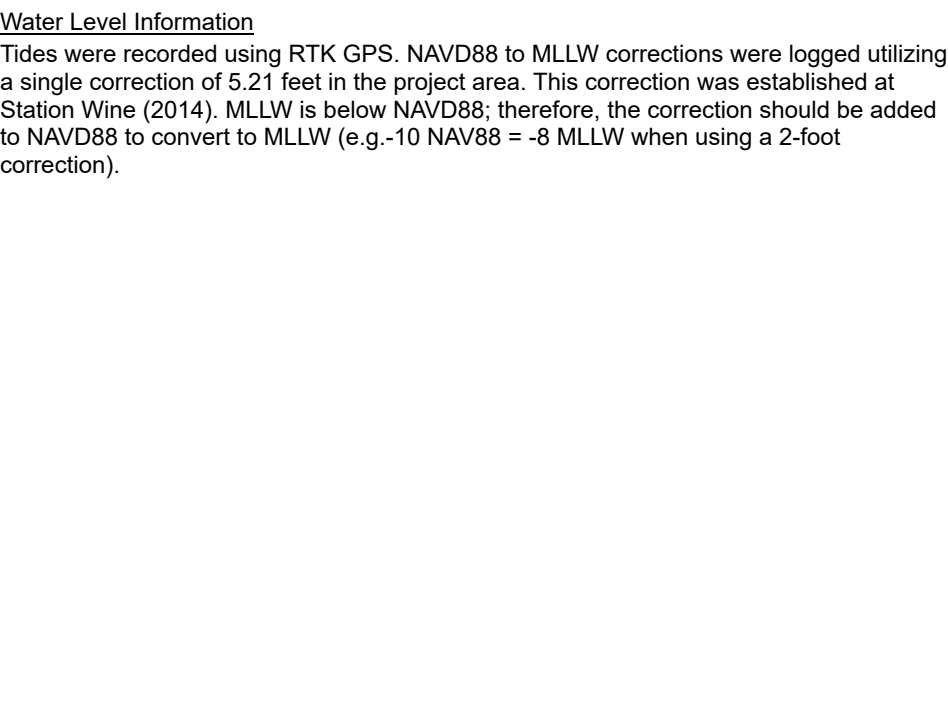
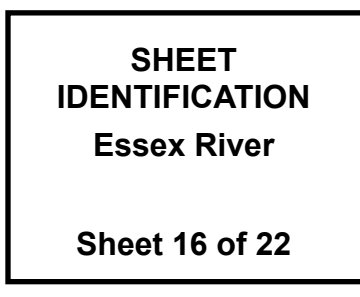
**ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY**

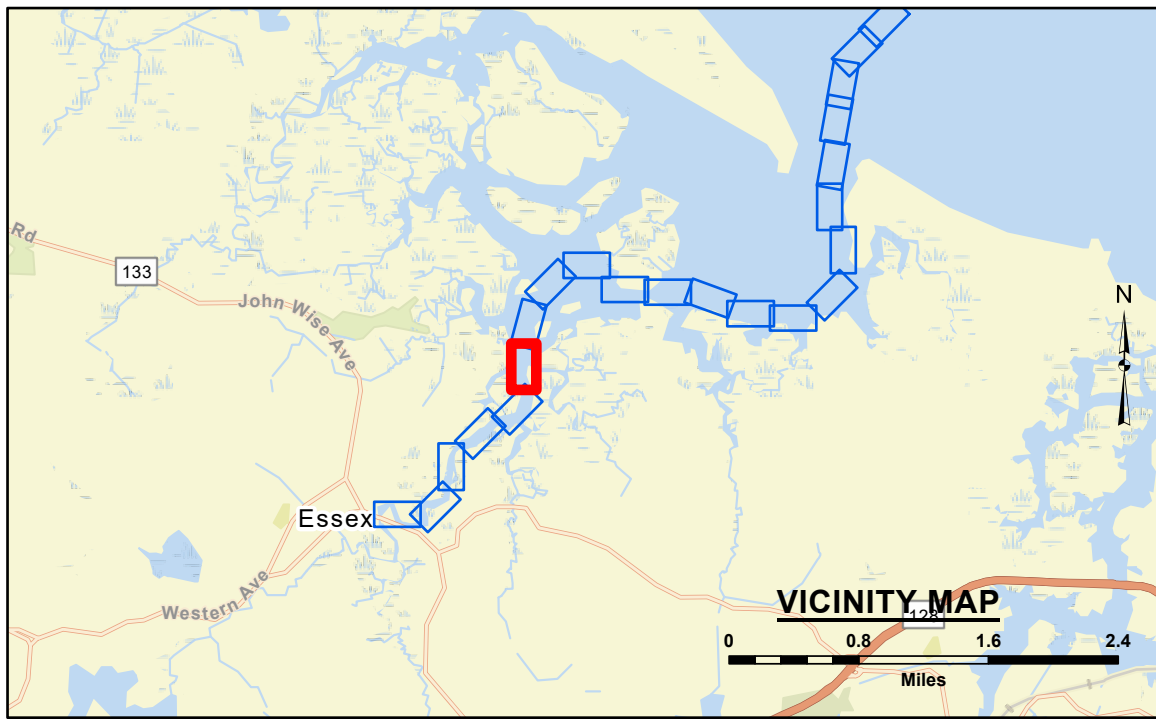
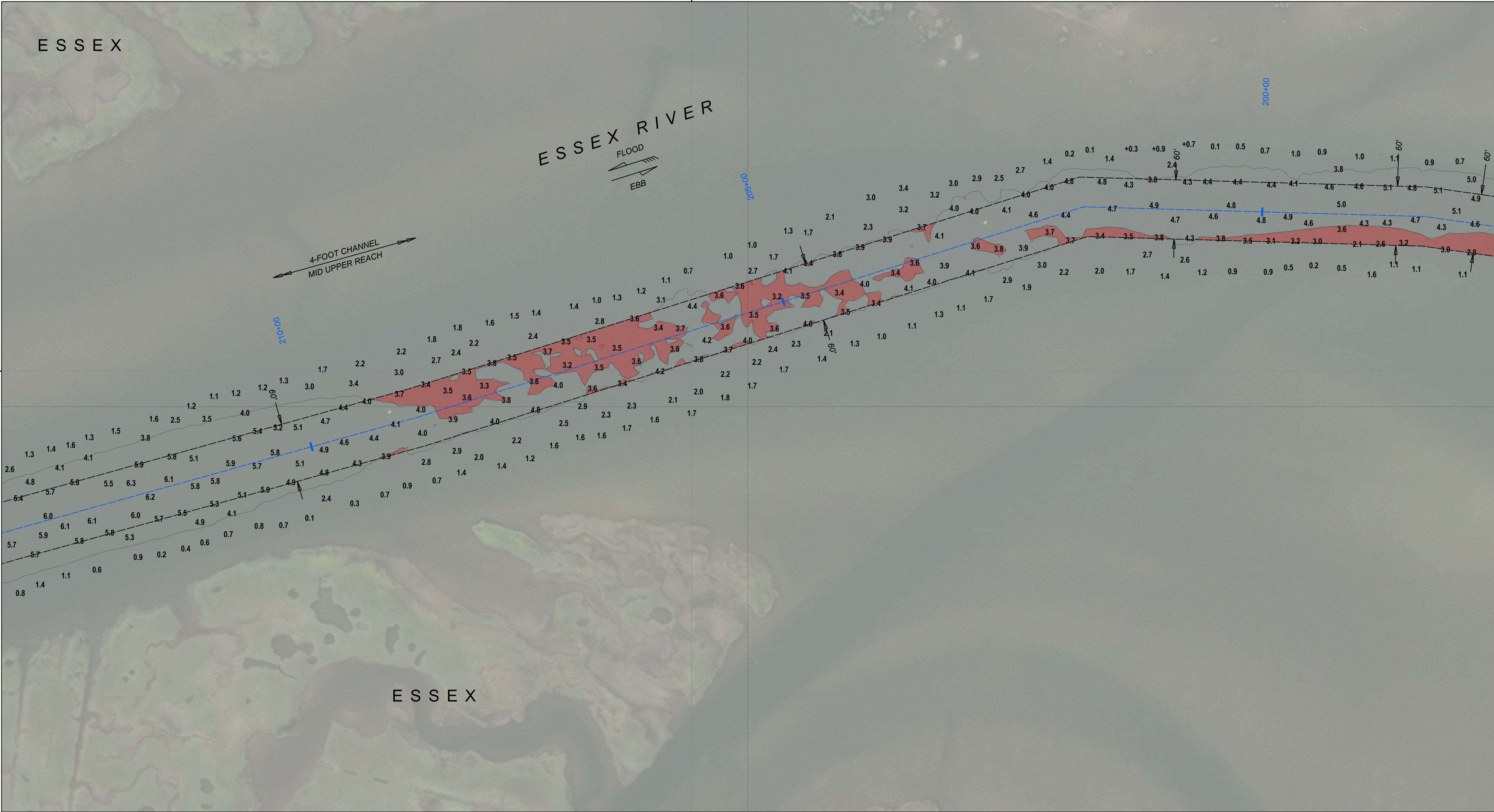
**4-FOOT CHANNEL AND
4-FOOT TURNING BASIN**

File Name: MA_04_ESS_20250225_AD_003

**SHEET
IDENTIFICATION
Essex River**

Sheet 15 of 22





LEGEND

--- Federal Navigation Channel

--- Channel Center Line

--- Marine Infrastructure*

..... Cable or Pipeline Area

--- Contour Line

⊗ Obstruction Point

⊗ Fixed Navigation Aids

! Red Navigation Buoy

! Green Navigation Buoy

! Navigation Buoy

■ Shoaling Area

● Shoalest Sounding**

GRAPHIC SCALE

1" = 50'

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach
* Present at Time of Survey

Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 KHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

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Project Remarks
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Water Level Information
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US Army Corps of Engineers
District: CENAE

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT			
SUBMITTED BY: Zachary McAvoy		SURVEYED BY: MJO	
APPROVED BY: NAE Survey		CHECKED BY: WHW	
SIZE: ANSI D	MAP DOCUMENT: MA_04_ESS_20250225_AD_003		ISSUE DATE: 3/7/2025

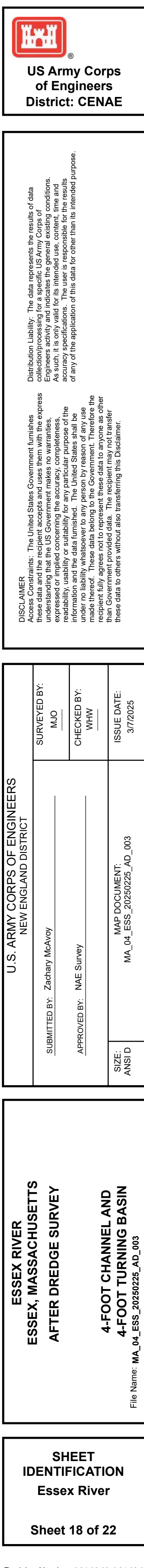
ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

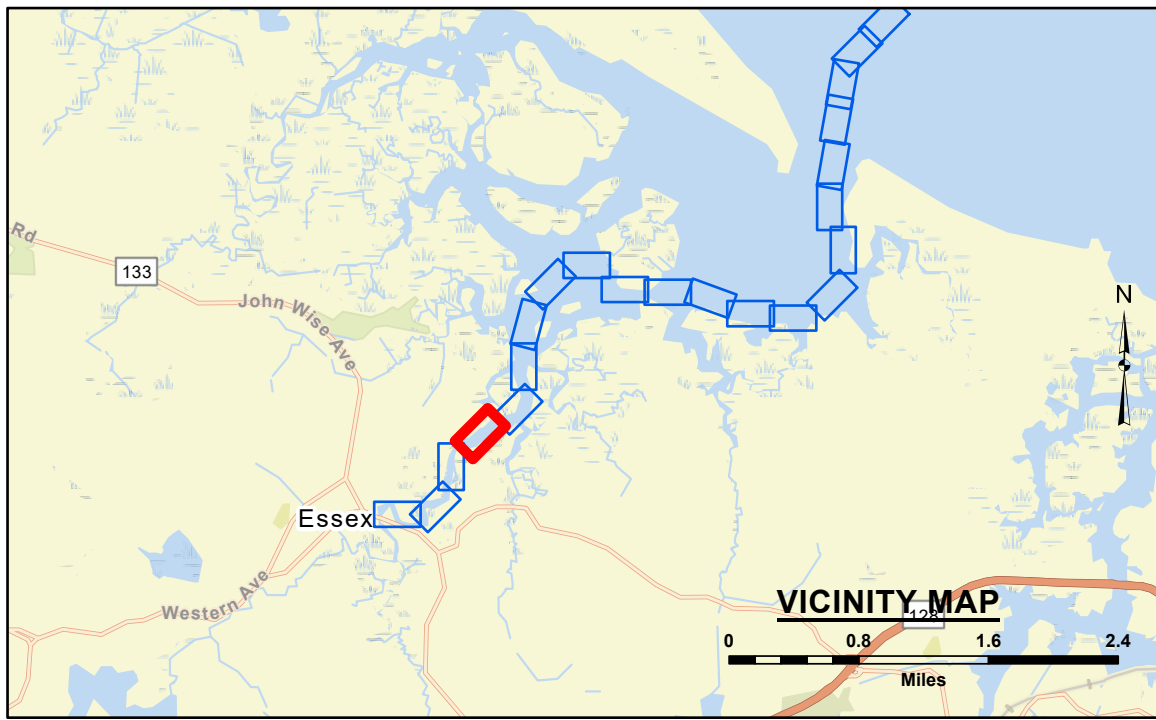
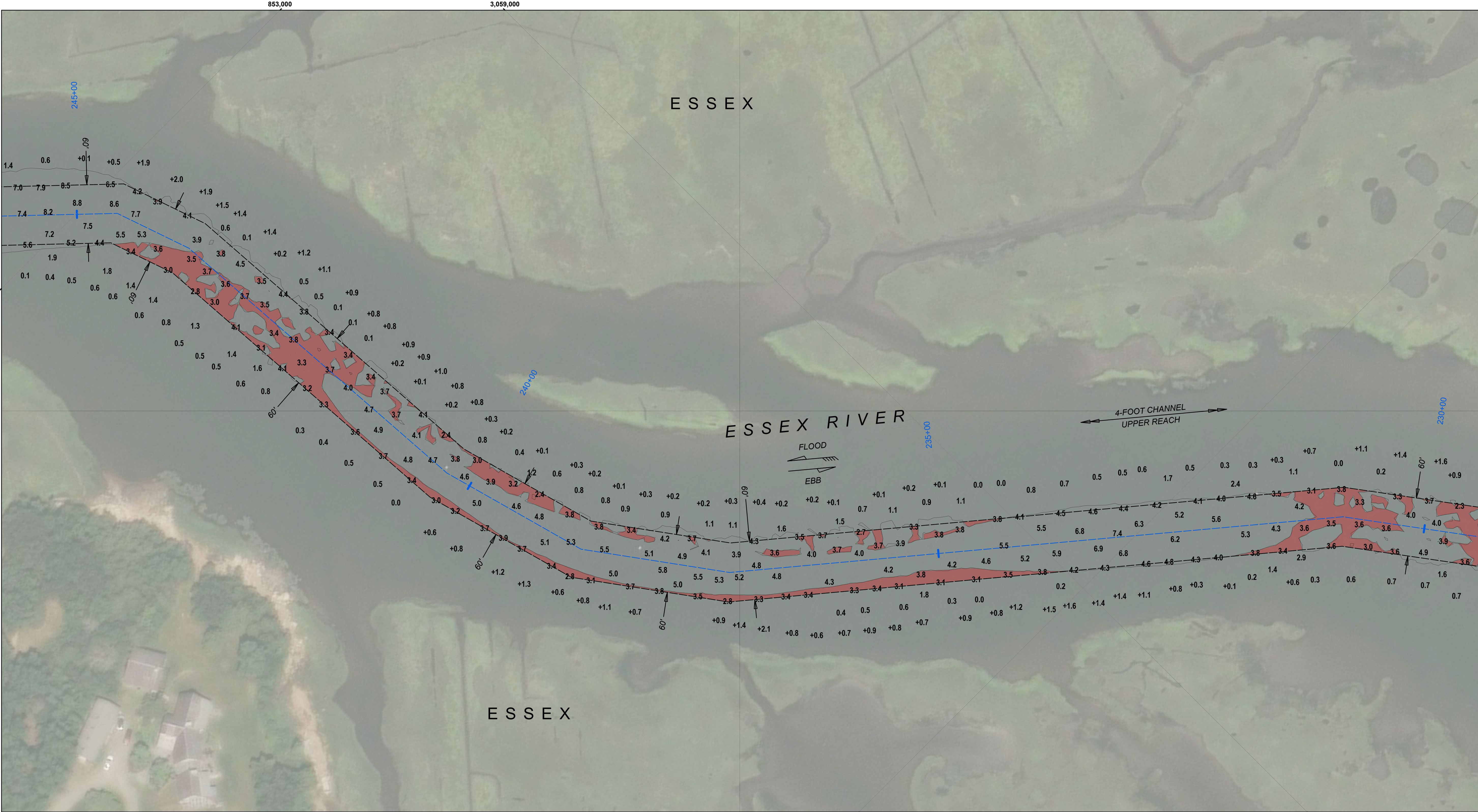
4-FOOT CHANNEL AND
4-FOOT TURNING BASIN

File Name: MA_04_ESS_20250225_AD_003

SHEET
IDENTIFICATION
Essex River

Sheet 17 of 22





LEGEND

--- Federal Navigation Channel

--- Channel Center Line

--- Marine Infrastructure*

..... Cable or Pipeline Area

— Contour Line

⊗ Obstruction Point

⊗ Fixed Navigation Aids

! Red Navigation Buoy

! Green Navigation Buoy

! Navigation Buoy

■ Shoaling Area

● Shoalest Sounding**

GRAPHIC SCALE

1" = 50'

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach
* Present at Time of Survey

Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson TS0 (Multibeam Sonar)
Sounding Frequency: 300 KHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

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Project Remarks
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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT	SURVEYED BY: MJO	CHECKED BY: WHW	ISSUE DATE: 3/7/2025
	SUBMITTED BY: Zachary McAvoy	APPROVED BY: NAE Survey	MAP DOCUMENT MA_04_ESS_20250225_AD_003
SIZE A1SD			

**ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY**

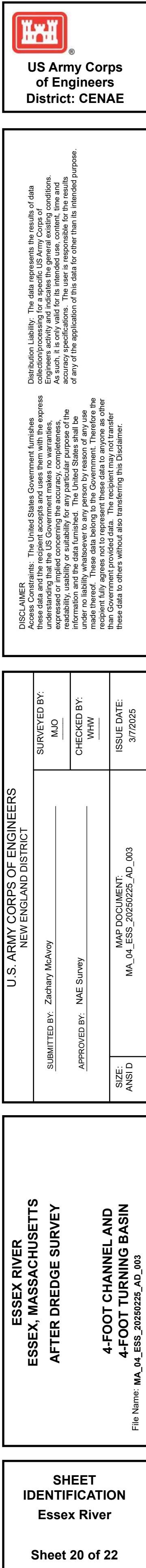
**4-FOOT CHANNEL AND
4-FOOT TURNING BASIN**

File Name: MA_04_ESS_20250225_AD_003

**SHEET
IDENTIFICATION
Essex River**

Sheet 19 of 22

Revision Number: 5.24.09.03-5.24.09.03



[illegible]

U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT		SURVEYED BY: NAO CHECKED BY: WHW ISSUE DATE: 3/7/2025	
SUBMITTED BY: Zachary McAnoy APPROVED BY: NAE Survey	MAP DOCUMENT: MA_04_ESS_20250225_AD_003		
SIZE: ANSTD			

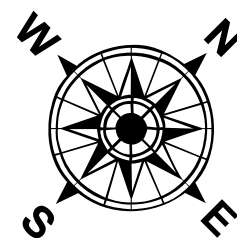
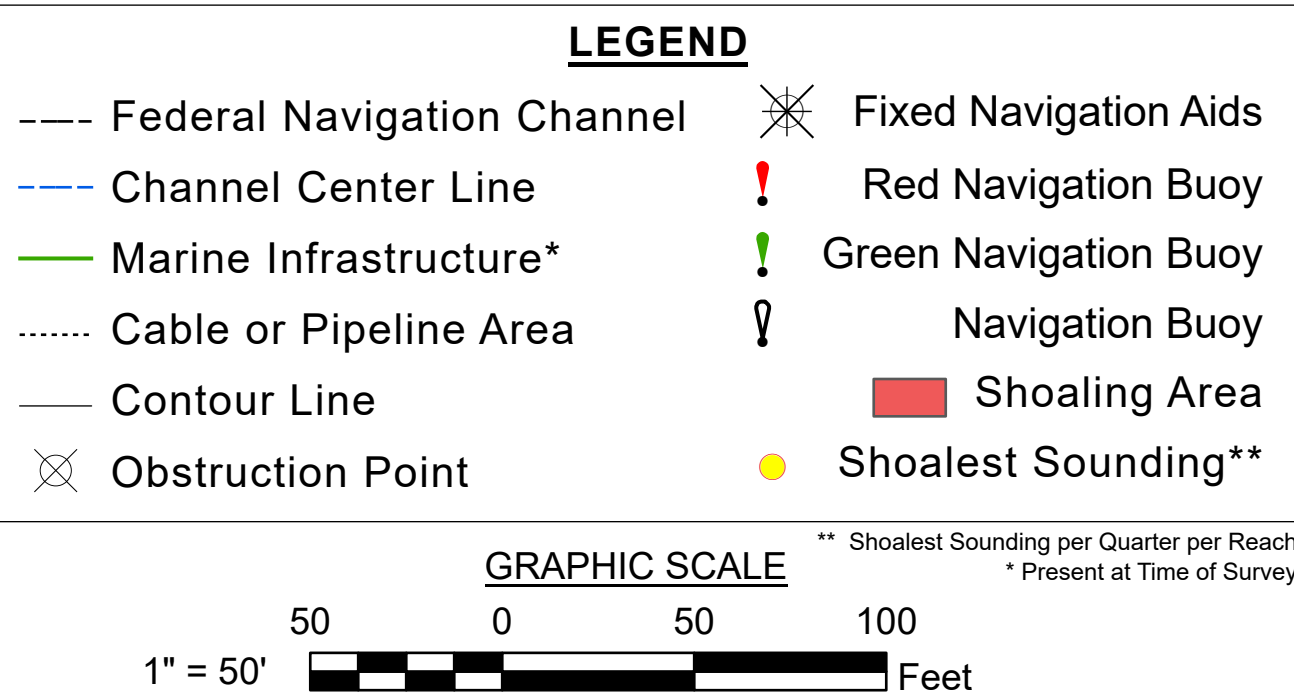
ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

4-FOOT CHANNEL AND
4-FOOT TURNING BASIN

File Name: MA_04_ESS_20250225_AD_003

**SHEET
IDENTIFICATION**
Essex River

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Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 kHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Range (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 498
Survey No.: NAOA Chart No.: ESS_20250225_AA_003
Reference NOAA Chart No.: ENC US44M40M, US44M40M

The information depicted on these charts represents the results of surveys made on the dates indicated, and can only be considered as indicating the conditions existing at that time.

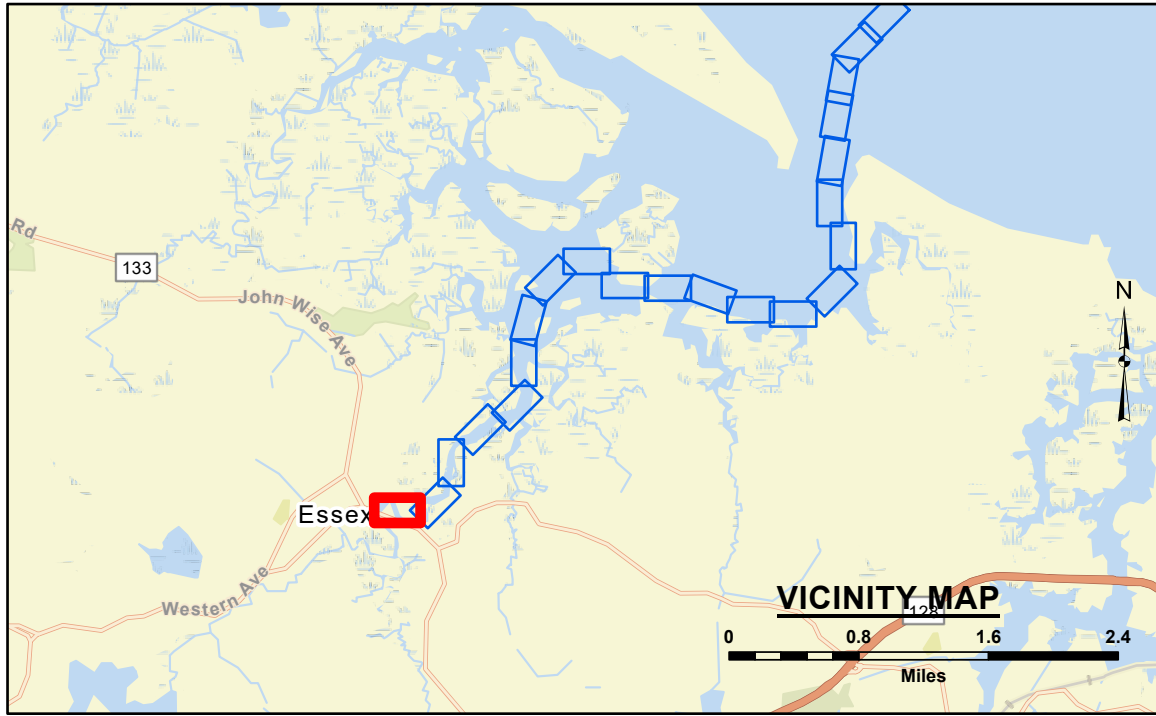
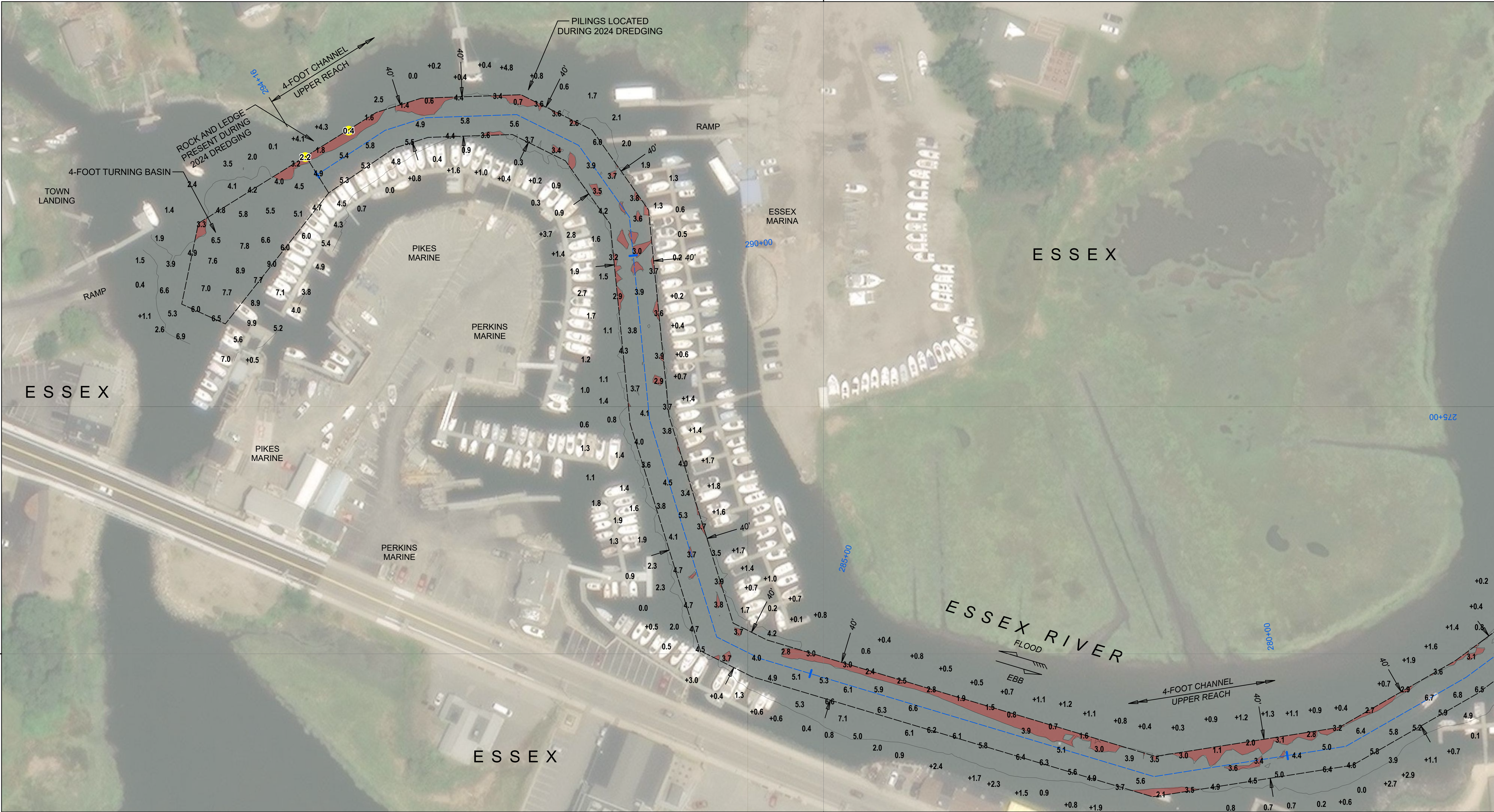
General Notes

The sounding information shown on this map represents the SHOALEST soundings of two soundings from hydrographic surveys conducted during February 2025. The positions of aids to navigation were located during survey operations. They are provided for information only and should not be used for navigation. Orthomography is from a variety of sources and dates and is intended to portray general characteristics of the shoreline and other features. Temporal changes may have occurred since this dataset was collected and some parts may no longer be an accurate representation of the conditions. The information depicted on this map should NOT be used to determine volumes as volumes are determined from more sounding information than shown.

Project Remarks
Survey includes investigation route adjacent to and between stations 90+00 and 125+00 of the Federal Navigation Project (FNP) areas of dynamic shoal movement, rock, hard material and pilings present during dredging.

Water Level Information

Tides were recorded using RTK GPS. NAVD88 to MLLW corrections were logged utilizing a single correction of 5.21 feet in the project area. This correction was established at Station Wine (2014). MLLW is below NAVD88; therefore, the correction should be added to NAVD88 to convert to MLLW (e.g., -10 NAV88 = -8 MLLW when using a 2-foot correction).



LEGEND

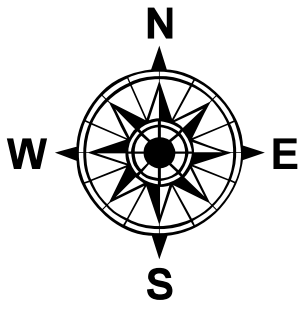
--- Federal Navigation Channel	✕ Fixed Navigation Aids
- - - Channel Center Line	! Red Navigation Buoy
— Marine Infrastructure*	! Green Navigation Buoy
..... Cable or Pipeline Area	⚓ Navigation Buoy
— Contour Line	■ Shoaling Area
⊗ Obstruction Point	● Shoalest Sounding**

GRAPHIC SCALE

1" = 50'

50 0 50 100 Feet

** Shoalest Sounding per Quarter per Reach
* Present at Time of Survey



Notes:
Horizontal Datum: Mass Mainland, MA-2001 NAD 83
Distance Units: U.S. Survey Feet
Vertical Datum: MLLW
Depth Units: U.S. Survey Feet
Vessel Name: POPHAM BEACH
Sonar System: Reson T50 (Multibeam Sonar)
Sounding Frequency: 300 KHz
Survey Method: RTK GPS TIDES
GPS System: INS Integrated Reson (RTK)
RTK Base Station: BM WINE (2014)
Software Used: Hypack
Sounding Sort Distance: 30'
Field Books: R&H 4981
Survey No.: MA_04_ESS_20250225_AD_003
Reference NOAA Chart No.: ENC US4MA04M, US4MA03M

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US Army Corps of Engineers
District: CENAE

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U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DISTRICT	SURVEYED BY: MJO	CHECKED BY: WHW	ISSUE DATE: 3/7/2025
	SUBMITTED BY: Zachary McAvoy	APPROVED BY: NAE Survey	MAP DOCUMENT MA_04_ESS_20250225_AD_003
	SIZE: A1 STD		

ESSEX RIVER
ESSEX, MASSACHUSETTS
AFTER DREDGE SURVEY

4-FOOT CHANNEL AND 4-FOOT TURNING BASIN

File Name: MA_04_ESS_20250225_AD_003

SHEET IDENTIFICATION
Essex River

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