

Environmental Notification Form Package

Town of Nantucket Maintenance Dredging

January 2026

Prepared By:

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Prepared For:

Commonwealth of Massachusetts
Executive Office of Energy and Environmental
Affairs
Massachusetts Environmental Policy Act
(MEPA) Office

Our Ref:

30145716

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Attachment A

Environmental Notification Form

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Massachusetts Environmental Policy Act (MEPA) Office

7 Environmental Notification Form

<i>For Office Use Only</i>
EEA#: _____
MEPA Analyst: _____

The information requested on this form must be completed in order to submit a document electronically for review under the Massachusetts Environmental Policy Act, 301 CMR 11.00.

Project Name: Polpis Harbor and Hither Creek Maintenance Dredging		
Street Address:		
Municipality: Nantucket	Watershed: Nantucket Harbor, Hither Creek/Madaket Harbor	
Universal Transverse Mercator Coordinates:	Latitude: 41.304457, 41.274393 Longitude: -70.021136, -70.201726	
Estimated commencement date: October 2026	Estimated completion date: January 2037	
Project Type: Dredging	Status of project design: 60 %complete	
Proponent: Town of Nantucket		
Street Address: 16 Broad Street		
Municipality: Nantucket	State: MA	Zip Code: 02554
Name of Contact Person: Vincent Murphy		
Firm/Agency: Town of Nantucket Natural Resources Department	Street Address: 131 Pleasant Street, 2 nd Floor	
Municipality: Nantucket	State: MA	Zip Code: 02554
Phone: (508) 228 7200 Ext 7608	Fax:	E-mail: vmurphy@nantucket-ma.gov
<p>Does this project meet or exceed a mandatory EIR threshold (see 301 CMR 11.03)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>If this is an Expanded Environmental Notification Form (ENF) (see 301 CMR 11.05(7)) or a Notice of Project Change (NPC), are you requesting:</p> <p>a Single EIR? (see 301 CMR 11.06(8)) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No a Rollover EIR? (see 301 CMR 11.06(13)) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No a Special Review Procedure? (see 301 CMR 11.09) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No a Waiver of mandatory EIR? (see 301 CMR 11.11) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No a Phase I Waiver? (see 301 CMR 11.11) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>(Note: Greenhouse Gas Emissions analysis must be included in the Expanded ENF.)</i></p> <p>Which MEPA review threshold(s) does the project meet or exceed (see 301 CMR 11.03)? (3) Wetlands, Waterways, and Tidelands – Project includes dredging of 10,000 or more cy of material and disposal of 10,000 or more cy of dredged material. Which State Agency Permits will the project require? Wetlands Notice of Intent to MassDEP, Ch. 91 License, 401 Water Quality Certification. Identify any financial assistance or land transfer from an Agency of the Commonwealth, including the Agency name and the amount of funding or land area in acres: N/A</p>		

Summary of Project Size & Environmental Impacts	Existing	Change	Total
LAND			
Total site acreage	9.66		
New acres of land altered		9.66	
Acres of impervious area	0.00	0.00	0.00
Square feet of new bordering vegetated wetlands alteration		0.00	
Square feet of new other wetland alteration		0.00	
Acres of new non-water dependent use of tidelands or waterways		0.00	
STRUCTURES			
Gross square footage	N/A	N/A	N/A
Number of housing units	N/A	N/A	N/A
Maximum height (feet)	N/A	N/A	N/A
TRANSPORTATION			
Vehicle trips per day	N/A	N/A	N/A
Parking spaces	N/A	N/A	N/A
WASTEWATER			
Water Use (Gallons per day)	N/A	N/A	N/A
Water withdrawal (GPD)	N/A	N/A	N/A
Wastewater generation/treatment (GPD)	N/A	N/A	N/A
Length of water mains (miles)	N/A	N/A	N/A
Length of sewer mains (miles)	N/A	N/A	N/A
<p>Has this project been filed with MEPA before? <input type="checkbox"/> Yes (____) <input checked="" type="checkbox"/> No</p>			
<p>Has any project on this site been filed with MEPA before? <input checked="" type="checkbox"/> Yes (EEA #15241, Polpis Harbor only) <input type="checkbox"/> No</p>			

GENERAL PROJECT INFORMATION – all proponents must fill out this section

PROJECT DESCRIPTION:

Describe the existing conditions and land uses on the project site:
See Attachment B: Supplemental Narrative.

Describe the proposed project and its programmatic and physical elements:
See Attachment B: Supplemental Narrative.

NOTE: The project description should summarize both the project's direct and indirect impacts (including construction period impacts) in terms of their magnitude, geographic extent, duration and frequency, and reversibility, as applicable. It should also discuss the infrastructure requirements of the project and the capacity of the municipal and/or regional infrastructure to sustain these requirements into the future.

Describe the on-site project alternatives (and alternative off-site locations, if applicable), considered by the proponent, including at least one feasible alternative that is allowed under current zoning, and the reasons(s) that they were not selected as the preferred alternative:
See Attachment B: Supplemental Narrative.

NOTE: *The purpose of the alternatives analysis is to consider what effect changing the parameters and/or siting of a project, or components thereof, will have on the environment, keeping in mind that the objective of the MEPA review process is to avoid or minimize damage to the environment to the greatest extent feasible. Examples of alternative projects include alternative site locations, alternative site uses, and alternative site configurations.*

Summarize the mitigation measures proposed to offset the impacts of the preferred alternative:
See Attachment B: Supplemental Narrative.

If the project is proposed to be constructed in phases, please describe each phase:
See Attachment B: Supplemental Narrative.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN:

Is the project within or adjacent to an Area of Critical Environmental Concern?

- Yes (Specify:)
 No

if yes, does the ACEC have an approved Resource Management Plan? Yes No;
If yes, describe how the project complies with this plan.

Will there be stormwater runoff or discharge to the designated ACEC? ___ Yes ___ No;

If yes, describe and assess the potential impacts of such stormwater runoff/discharge to the designated ACEC.

RARE SPECIES:

Does the project site include Estimated and/or Priority Habitat of State-Listed Rare Species? (see http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/priority_habitat/priority_habitat_home.htm)

- Yes (Specify: See Attachment B: Supplemental Narrative.) No

HISTORICAL /ARCHAEOLOGICAL RESOURCES:

Does the project site include any structure, site or district listed in the State Register of Historic Place or the inventory of Historic and Archaeological Assets of the Commonwealth?

- Yes (Specify: See Attachment B: Supplemental Narrative) No

If yes, does the project involve any demolition or destruction of any listed or inventoried historic or archaeological resources? Yes (Specify___) No

WATER RESOURCES:

Is there an Outstanding Resource Water (ORW) on or within a half-mile radius of the project site? Yes **No X**;
if yes, identify the ORW and its location. _____

(NOTE: Outstanding Resource Waters include Class A public water supplies, their tributaries, and bordering wetlands; active and inactive reservoirs approved by MassDEP; certain waters within Areas of Critical Environmental Concern, and certified vernal pools. Outstanding resource waters are listed in the Surface Water Quality Standards, 314 CMR 4.00.)

Are there any impaired water bodies on or within a half-mile radius of the project site? **Yes No**; if yes, identify the water body and pollutant(s) causing the impairment: See Attachment B: Supplemental Narrative.

Is the project within a medium or high stress basin, as established by the Massachusetts Water Resources Commission? ___Yes ___**No X**

STORMWATER MANAGEMENT:

Generally describe the project's stormwater impacts and measures that the project will take to comply with the standards found in MassDEP's Stormwater Management Regulations:_____

MASSACHUSETTS CONTINGENCY PLAN:

Has the project site been, or is it currently being, regulated under M.G.L.c.21E or the Massachusetts Contingency Plan? Yes ___ **No X**_; if yes, please describe the current status of the site (including Release Tracking Number (RTN), cleanup phase, and Response Action Outcome classification):_____

Is there an Activity and Use Limitation (AUL) on any portion of the project site? Yes ___ **No X**_; if yes, describe which portion of the site and how the project will be consistent with the AUL: _____.

Are you aware of any Reportable Conditions at the property that have not yet been assigned an RTN? Yes ___ **No X**_; if yes, please describe:_____

SOLID AND HAZARDOUS WASTE:

If the project will generate solid waste during demolition or construction, describe alternatives considered for re-use, recycling, and disposal of, e.g., asphalt, brick, concrete, gypsum, metal, wood: N/A

(NOTE: Asphalt pavement, brick, concrete and metal are banned from disposal at Massachusetts landfills and waste combustion facilities and wood is banned from disposal at Massachusetts landfills. See 310 CMR 19.017 for the complete list of banned materials.)

Will your project disturb asbestos containing materials? Yes **No X**;
if yes, please consult state asbestos requirements at <http://mass.gov/MassDEP/air/asbhom01.htm>

Describe anti-idling and other measures to limit emissions from construction equipment:
See Attachment B: Supplemental Narrative.

DESIGNATED WILD AND SCENIC RIVER:

Is this project site located wholly or partially within a defined river corridor of a federally designated Wild and Scenic River or a state designated Scenic River? Yes ___ **No X**_;
if yes, specify name of river and designation:

If yes, does the project have the potential to impact any of the "outstandingly remarkable" resources of a federally Wild and Scenic River or the stated purpose of a state designated Scenic River? Yes ___ **No X**_; if yes, specify name of river and designation: _____;
if yes, will the project will result in any impacts to any of the designated "outstandingly remarkable" resources of the Wild and Scenic River or the stated purposes of a Scenic River.
Yes ___ **No X**;

if yes, describe the potential impacts to one or more of the “outstandingly remarkable” resources or stated purposes and mitigation measures proposed.

ATTACHMENTS:

1. List of all attachments to this document.

Attachment A. Environmental Notification Form

Attachment B. Supplemental Narrative: includes project details, regulatory compliance and mitigation, and a list of municipal and federal permits and reviews required.

Attachment C. Figures: includes U.S.G.S. Site Map, Existing Conditions Map, Sediment Sampling Locations Map, Shellfish and Eelgrass Populations Map, NHESP Habitat Map, Environmental Justice Population Map, and Sand Bank Locations

Attachment D. MassDEP 2016 Approvals

Attachment E. Site Photographs

Attachment F. FEMA FIRM Panels

Attachment G. Sediment Analyses: demonstrate results of sediment core collection and analysis from project area in 2016, 2023 and 2025.

Attachment H. Eelgrass Findings: demonstrate results of eelgrass findings and analysis from project area in 2016, 2023 and 2025.

Attachment I. NHESP Letter: rare species located in proximate Estimated/Priority Habitat

Attachment J. Post Dredge Backfill Rate Analysis: both sites experience variable sediment backfill rates.

Attachment K. Project Drawings: shows project location in relation to resource areas and proposed conditions. Includes cross-sections and construction details.

Attachment L. Town Notice

Attachment M. MEPA Distribution List: MEPA Distribution List: of all agencies and persons to whom the proponent circulated the ENF, in accordance with 301 CMR 11.16(2).

Attachment N. RMAT Resilience Report

LAND SECTION – all proponents must fill out this section

I. Thresholds / Permits

- A. Does the project meet or exceed any review thresholds related to **land** (see 301 CMR 11.03(1))
___ Yes X **No**; if yes, specify each threshold:

II. Impacts and Permits

- A. Describe, in acres, the current and proposed character of the project site, as follows:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Footprint of buildings	<u>0</u>	<u>0</u>	<u>0</u>
Internal roadways	<u>0</u>	<u>0</u>	<u>0</u>
Parking and other paved areas	<u>0</u>	<u>0</u>	<u>0</u>
Other altered areas	<u>0</u>	<u>0</u>	<u>0</u>
Undeveloped areas	9.66	0.00	9.66
Total: Project Site Acreage	<u>9.66</u>	0.00	9.66

- B. Has any part of the project site been in active agricultural use in the last five years?
___ Yes X **No**; if yes, how many acres of land in agricultural use (with prime state or locally important agricultural soils) will be converted to nonagricultural use?
- C. Is any part of the project site currently or proposed to be in active forestry use?
___ Yes X **No**; if yes, please describe current and proposed forestry activities and indicate whether any part of the site is the subject of a forest management plan approved by the Department of Conservation and Recreation:
- D. Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97? ___ Yes X **No**; if yes, describe:
- E. Is any part of the project site currently subject to a conservation restriction, preservation restriction, agricultural preservation restriction or watershed preservation restriction?
___ Yes X **No**; if yes, does the project involve the release or modification of such restriction?
___ Yes X **No**; if yes, describe:
- F. Does the project require approval of a new urban redevelopment project or a fundamental change in an existing urban redevelopment project under M.G.L.c.121A? ___ Yes X **No**; if yes, describe:
- G. Does the project require approval of a new urban renewal plan or a major modification of an existing urban renewal plan under M.G.L.c.121B? Yes ___ **No** X; if yes, describe:

III. Consistency

- A. Identify the current municipal comprehensive land use plan
Title: Nantucket Master Plan Date 2009 (in process of updating)_
- B. Describe the project's consistency with that plan with regard to:
- 1) economic development: The project will aid in the goal of easily operating in the waters for industrial industries and for improving accessibilities for harbors and beaches to promote their tourism economies.
 - 2) adequacy of infrastructure: This project assists in the adequacy of infrastructure by improving ports and harbors, vital aspects of the infrastructure.
 - 3) open space impacts: This project will aid the goal of managing open space for preservation of natural habitats and a clean and plentiful water source by supporting the water infrastructure.
 - 4) compatibility with adjacent land uses: This project will increase the use of Nantucket's waterways and open spaces.

- C. Identify the current Regional Policy Plan of the applicable Regional Planning Agency (RPA)
RPA: Nantucket Planning & Economic Development Commission (NP&EDC)

Title: Nantucket Town Area Plan Date: June 23rd, 2025

- D. Describe the project's consistency with that plan with regard to:
- 1) economic development: this project will continue to ensure clean and safe water for residents.
 - 2) adequacy of infrastructure: this project will continue to ensure there is safe water infrastructure in place.
 - 3) open space impacts: the project will continue to ensure that all residents of the region have access to open spaces regardless of age, income, race/ethnicity, or ability.

RARE SPECIES SECTION

I. Thresholds / Permits

- A. Will the project meet or exceed any review thresholds related to **rare species or habitat** (see 301 CMR 11.03(2))? ___ Yes **No**; if yes, specify, in quantitative terms:

(NOTE: If you are uncertain, it is recommended that you consult with the Natural Heritage and Endangered Species Program (NHESP) prior to submitting the ENF.)

- B. Does the project require any state permits related to **rare species or habitat**? ___ Yes **No**
- C. Does the project site fall within mapped rare species habitat (Priority or Estimated Habitat?) in the current Massachusetts Natural Heritage Atlas (attach relevant page)? **Yes** ___ No.
- D. If you answered "No" to all questions A, B and C, proceed to the **Wetlands, Waterways, and Tidelands Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Rare Species section below.

II. Impacts and Permits

- A. Does the project site fall within Priority or Estimated Habitat in the current Massachusetts Natural Heritage Atlas (attach relevant page)? **Yes** ___ No. If yes,
1. Have you consulted with the Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP)? **Yes** ___ No; if yes, have you received a determination as to whether the project will result in the "take" of a rare species? ___ Yes ___ No; if yes, attach the letter of determination to this submission. See Attachment I
 2. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes **No**; if yes, provide a summary of proposed measures to minimize and mitigate rare species impacts
 3. Which rare species are known to occur within the Priority or Estimated Habitat?
See Attachment B: Supplemental Narrative
 4. Has the site been surveyed for rare species in accordance with the Massachusetts Endangered Species Act? ___ **Yes** ___ No
 4. If your project is within Estimated Habitat, have you filed a Notice of Intent or received an Order of Conditions for this project? ___ Yes ___ **No**; if yes, did you send a copy of the Notice of Intent to the Natural Heritage and Endangered Species Program, in accordance with the Wetlands Protection Act regulations? **Yes (planned but not yet submitted)** ___ No
- B. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes **No**; if yes, provide a summary of proposed measures to minimize and mitigate impacts to significant habitat:

WETLANDS, WATERWAYS, AND TIDELANDS SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wetlands, waterways, and tidelands** (see 301 CMR 11.03(3))? **Yes** ___ No; if yes, specify, in quantitative terms: See Attachment B: Supplemental Narrative.

B. Does the project require any state permits (or a local Order of Conditions) related to **wetlands, waterways, or tidelands**? **Yes** ___ No; if yes, specify which permit: Massachusetts General Law Chapter 91 license and Wetlands Protection Act Notice of Intent.

C. If you answered "No" to both questions A and B, proceed to the **Water Supply Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wetlands, Waterways, and Tidelands Section below.

II. Wetlands Impacts and Permits

A. Does the project require a new or amended Order of Conditions under the Wetlands Protection Act (M.G.L. c.131A)? **Yes** ___ No; if yes, has a Notice of Intent been filed? ___ Yes **No**; if yes, list the date and MassDEP file number: _____; if yes, has a local Order of Conditions been issued? ___ Yes ___ No; Was the Order of Conditions appealed? ___ Yes ___ No. Will the project require a Variance from the Wetlands regulations? ___ Yes **No**.

B. Describe any proposed permanent or temporary impacts to wetland resource areas located on the project site: See Attachment B: Supplemental Narrative.

C. Estimate the extent and type of impact that the project will have on wetland resources, and indicate whether the impacts are temporary or permanent:

<u>Coastal Wetlands</u>	<u>Area (square feet) or Length (linear feet)</u>	<u>Temporary or Permanent Impact?</u>
Land Under the Ocean	419,032	Permanent
Designated Port Areas	_____	_____
Coastal Beaches	_____	_____
Coastal Dunes	_____	_____
Barrier Beaches	_____	_____
Coastal Banks	_____	_____
Rocky Intertidal Shores	_____	_____
Salt Marshes	_____	_____
Land Under Salt Ponds	_____	_____
Land Containing Shellfish	409,194	Permanent
Fish Runs	321,454	Permanent
Land Subject to Coastal Storm Flowage	419,032	Permanent
 <u>Inland Wetlands</u>		
Bank (lf)	_____	_____
Bordering Vegetated Wetlands	_____	_____
Isolated Vegetated Wetlands	_____	_____
Land under Water	_____	_____
Isolated Land Subject to Flooding	_____	_____
Bordering Land Subject to Flooding	_____	_____
Riverfront Area	_____	_____

D. Is any part of the project:

1. proposed as a **limited project**? ___ Yes **No**; if yes, what is the area (in sf)? _____

- 2. the construction or alteration of a **dam**? Yes **No**; if yes, describe:
- 3. fill or structure in a **velocity zone** or **regulatory floodway**? Yes **No**
- 4. dredging or disposal of dredged material? **Yes** **No**; if yes, describe the volume of dredged material and the proposed disposal site: See Attachment B:
Supplemental Narrative
- 5. a discharge to an **Outstanding Resource Water (ORW)** or an **Area of Critical Environmental Concern (ACEC)**? Yes **No**
- 6. subject to a wetlands restriction order? Yes **No**; if yes, identify the area (in sf):
- 7. located in buffer zones? Yes **No**; if yes, how much (in sf) _____

E. Will the project:

- 1. be subject to a local wetlands ordinance or bylaw? **Yes** **No**
- 2. alter any federally-protected wetlands not regulated under state law? Yes **No**; if yes, what is the area (sf)?

III. Waterways and Tidelands Impacts and Permits

A. Does the project site contain waterways or tidelands (including filled former tidelands) that are subject to the Waterways Act, M.G.L.c.91? **Yes** **No**; if yes, is there a current Chapter 91 license or permit affecting the project site? Yes **No**; if yes, list the date and permit number and provide a copy of the historic map used to determine extent of filled tidelands:

B. Does the project require a new or modified license or permit under M.G.L.c.91? **Yes** **No**; if yes, how many acres of the project site subject to M.G.L.c.91 will be for non-water-dependent use? Current 0 Change 0 Total 0
If yes, how many square feet of solid fill or pile-supported structures (in sf)? 0 sf

C. For non-water-dependent use projects, indicate the following:

Area of filled tidelands on the site: _____

Area of filled tidelands covered by buildings: _____

For portions of site on filled tidelands, list ground floor uses and area of each use:

N/A

Does the project include new non-water-dependent uses located over flowed tidelands?

Yes **No**

Height of building on filled tidelands N/A

Also show the following on a site plan: Mean High Water, Mean Low Water, Water-dependent Use Zone, location of uses within buildings on tidelands, and interior and exterior areas and facilities dedicated for public use, and historic high and historic low water marks.

D. Is the project located on landlocked tidelands? Yes **No**; if yes, describe the project's impact on the public's right to access, use and enjoy jurisdictional tidelands and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

E. Is the project located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations? **Yes** **No**; if yes, describe the project's impact on groundwater levels and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

F. Is the project non-water-dependent **and** located on landlocked tidelands **or** waterways or tidelands subject to the Waterways Act **and** subject to a mandatory EIR? Yes **No**;

(NOTE: If yes, then the project will be subject to Public Benefit Review and Determination.)

G. Does the project include dredging? **Yes** ___ No; if yes, answer the following questions:

What type of dredging? Improvement ___ Maintenance ___ **Both** ___

What is the proposed dredge volume, in cubic yards (cys) 66,836.12 cys _____

What is the proposed dredge footprint ___length (ft) ___width (ft)___depth (ft); **See**

Attachment B: Supplemental Narrative

Will dredging impact the following resource areas?

Intertidal Yes___ **No**_X_; if yes, ___ sq ft

Outstanding Resource Waters Yes___ **No**_X_; if yes, ___ sq ft

Other resource area (i.e. shellfish beds, eel grass beds) **Yes**_X_ No___; if yes
635,799 sq ft

If yes to any of the above, have you evaluated appropriate and practicable steps to: 1) avoidance; 2) if avoidance is not possible, minimization; 3) if either avoidance or minimize is not possible, mitigation?

See Attachment B: Supplemental Narrative

If no to any of the above, what information or documentation was used to support this determination?

See Attachment B: Supplemental Narrative

Provide a comprehensive analysis of practicable alternatives for improvement dredging in accordance with 314 CMR 9.07(1)(b). Physical and chemical data of the sediment shall be included in the comprehensive analysis.

See Attachment G: Sediment Analysis

Sediment Characterization

Existing gradation analysis results? **Yes** ___ No; if yes, provide results.

See Attachment B: Supplemental Narrative

Existing chemical results for parameters listed in 314 CMR 9.07(2)(b)6? ___ Yes
___X___ **No**; if yes, provide results.

Do you have sufficient information to evaluate feasibility of the following management options for dredged sediment? If yes, check the appropriate option.

Beach Nourishment **X**

Unconfined Ocean Disposal ___

Confined Disposal:

Confined Aquatic Disposal (CAD) ___

Confined Disposal Facility (CDF) ___

Landfill Reuse in accordance with COMM-97-001 ___

Shoreline Placement ___

Upland Material Reuse ___

In-State landfill disposal ___

Out-of-state landfill disposal ___

(NOTE: This information is required for a 401 Water Quality Certification.)

IV. Consistency:

A. Does the project have effects on the coastal resources or uses, and/or is the project located within the Coastal Zone? **Yes** ___ No; if yes, describe these effects and the projects consistency with the policies of the Office of Coastal Zone Management:

See Attachment B: Supplemental Narrative

B. Is the project located within an area subject to a Municipal Harbor Plan? **Yes** ___ No; if yes, identify the Municipal Harbor Plan and describe the project's consistency with that plan:

See Attachment B: Supplemental Narrative

WATER SUPPLY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **water supply** (see 301 CMR 11.03(4))? ___ Yes X **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **water supply**? ___ Yes X **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Wastewater Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Water Supply Section below.

II. Impacts and Permits

A. Describe, in gallons per day (gpd), the volume and source of water use for existing and proposed activities at the project site:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Municipal or regional water supply	_____	_____	_____
Withdrawal from groundwater	_____	_____	_____
Withdrawal from surface water	_____	_____	_____
Interbasin transfer	_____	_____	_____

(NOTE: Interbasin Transfer approval will be required if the basin and community where the proposed water supply source is located is different from the basin and community where the wastewater from the source will be discharged.)

B. If the source is a municipal or regional supply, has the municipality or region indicated that there is adequate capacity in the system to accommodate the project? ___ Yes ___ No

C. If the project involves a new or expanded withdrawal from a groundwater or surface water source, has a pumping test been conducted? ___ Yes ___ No; if yes, attach a map of the drilling sites and a summary of the alternatives considered and the results. _____

D. What is the currently permitted withdrawal at the proposed water supply source (in gallons per day)? _____ Will the project require an increase in that withdrawal? ___ Yes ___ No; if yes, then how much of an increase (gpd)? _____

E. Does the project site currently contain a water supply well, a drinking water treatment facility, water main, or other water supply facility, or will the project involve construction of a new facility? ___ Yes ___ No. If yes, describe existing and proposed water supply facilities at the project site:

	<u>Permitted Flow</u>	<u>Existing Avg Daily Flow</u>	<u>Project Flow</u>	<u>Total</u>
Capacity of water supply well(s) (gpd)	_____	_____	_____	_____
Capacity of water treatment plant (gpd)	_____	_____	_____	_____

F. If the project involves a new interbasin transfer of water, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or proposed?

G. Does the project involve:

1. new water service by the Massachusetts Water Resources Authority or other agency of the Commonwealth to a municipality or water district? ___ Yes ___ No
2. a Watershed Protection Act variance? ___ Yes ___ No; if yes, how many acres of alteration?
3. a non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking

water supply for purpose of forest harvesting activities? ___ Yes ___ No

III. Consistency

Describe the project's consistency with water conservation plans or other plans to enhance water resources, quality, facilities and services:

WASTEWATER SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wastewater** (see 301 CMR 11.03(5))? ___ Yes X **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **wastewater**? ___ Yes X **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Transportation -- Traffic Generation Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wastewater Section below.

II. Impacts and Permits

A. Describe the volume (in gallons per day) and type of disposal of wastewater generation for existing and proposed activities at the project site (calculate according to 310 CMR 15.00 for septic systems or 314 CMR 7.00 for sewer systems):

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Discharge of sanitary wastewater	_____	_____	_____
Discharge of industrial wastewater	_____	_____	_____
TOTAL	_____	_____	_____

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Discharge to groundwater	_____	_____	_____
Discharge to outstanding resource water	_____	_____	_____
Discharge to surface water	_____	_____	_____
Discharge to municipal or regional wastewater facility	_____	_____	_____
TOTAL	_____	_____	_____

B. Is the existing collection system at or near its capacity? ___ Yes ___ No; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:

C. Is the existing wastewater disposal facility at or near its permitted capacity? ___ Yes ___ No; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:

D. Does the project site currently contain a wastewater treatment facility, sewer main, or other wastewater disposal facility, or will the project involve construction of a new facility? ___ Yes ___ No; if yes, describe as follows:

	<u>Permitted</u>	<u>Existing Avg Daily Flow</u>	<u>Project Flow</u>	<u>Total</u>
Wastewater treatment plant capacity (in gallons per day)	_____	_____	_____	_____

E. If the project requires an interbasin transfer of wastewater, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or new?

(NOTE: Interbasin Transfer approval may be needed if the basin and community where wastewater will be discharged is different from the basin and community where the source of water supply is located.)

F. Does the project involve new sewer service by the Massachusetts Water Resources Authority (MWRA) or other Agency of the Commonwealth to a municipality or sewer district? ___ Yes ___ No

G. Is there an existing facility, or is a new facility proposed at the project site for the storage, treatment, processing, combustion or disposal of sewage sludge, sludge ash, grit, screenings, wastewater reuse (gray water) or other sewage residual materials? ___ Yes ___ No; if yes, what is the capacity (tons per day):

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Storage	_____	_____	_____
Treatment	_____	_____	_____
Processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

H. Describe the water conservation measures to be undertaken by the project, and other wastewater mitigation, such as infiltration and inflow removal.

III. Consistency

A. Describe measures that the proponent will take to comply with applicable state, regional, and local plans and policies related to wastewater management:

B. If the project requires a sewer extension permit, is that extension included in a comprehensive wastewater management plan? ___ Yes ___ No; if yes, indicate the EEA number for the plan and whether the project site is within a sewer service area recommended or approved in that plan:

TRANSPORTATION SECTION (TRAFFIC GENERATION)

I. Thresholds / Permit

A. Will the project meet or exceed any review thresholds related to **traffic generation** (see 301 CMR 11.03(6))? ___ Yes X **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **state-controlled roadways**? ___ Yes X **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Roadways and Other Transportation Facilities Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Traffic Generation Section below.

II. Traffic Impacts and Permits

A. Describe existing and proposed vehicular traffic generated by activities at the project site:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Number of parking spaces	_____	_____	_____
Number of vehicle trips per day	_____	_____	_____
ITE Land Use Code(s):	_____	_____	_____

B. What is the estimated average daily traffic on roadways serving the site?

	<u>Roadway</u>	<u>Existing</u>	<u>Change</u>	<u>Total</u>
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____

C. If applicable, describe proposed mitigation measures on state-controlled roadways that the project proponent will implement:

D. How will the project implement and/or promote the use of transit, pedestrian and bicycle facilities and services to provide access to and from the project site?

C. Is there a Transportation Management Association (TMA) that provides transportation demand management (TDM) services in the area of the project site? ___ Yes ___ No; if yes, describe if and how will the project will participate in the TMA:

D. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation facilities? ___ Yes ___ No; if yes, generally describe:

E. If the project will penetrate approach airspace of a nearby airport, has the proponent filed a Massachusetts Aeronautics Commission Airspace Review Form (780 CMR 111.7) and a Notice of Proposed Construction or Alteration with the Federal Aviation Administration (FAA) (CFR Title 14 Part 77.13, forms 7460-1 and 7460-2)?

III. Consistency

Describe measures that the proponent will take to comply with municipal, regional, state, and federal plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services:

TRANSPORTATION SECTION (ROADWAYS AND OTHER TRANSPORTATION FACILITIES)

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **roadways or other transportation facilities** (see 301 CMR 11.03(6))? ___ Yes X **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **roadways or other transportation facilities**? ___ Yes X **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Energy Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Roadways Section below.

II. Transportation Facility Impacts

A. Describe existing and proposed transportation facilities in the immediate vicinity of the project site:

B. Will the project involve any

- 1. Alteration of bank or terrain (in linear feet)? _____
- 2. Cutting of living public shade trees (number)? _____
- 3. Elimination of stone wall (in linear feet)? _____

III. Consistency -- Describe the project's consistency with other federal, state, regional, and local plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services, including consistency with the applicable regional transportation plan and the Transportation Improvements Plan (TIP), the State Bicycle Plan, and the State Pedestrian Plan:

ENERGY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **energy** (see 301 CMR 11.03(7))? ___ Yes X **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **energy**? ___ Yes X **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Air Quality Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Energy Section below.

II. Impacts and Permits

A. Describe existing and proposed energy generation and transmission facilities at the project site:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Capacity of electric generating facility (megawatts)	_____	_____	_____
Length of fuel line (in miles)	_____	_____	_____
Length of transmission lines (in miles)	_____	_____	_____
Capacity of transmission lines (in kilovolts)	_____	_____	_____

B. If the project involves construction or expansion of an electric generating facility, what are:

1. the facility's current and proposed fuel source(s)?
2. the facility's current and proposed cooling source(s)?

C. If the project involves construction of an electrical transmission line, will it be located on a new, unused, or abandoned right of way? ___Yes ___No; if yes, please describe:

D. Describe the project's other impacts on energy facilities and services:

III. Consistency

Describe the project's consistency with state, municipal, regional, and federal plans and policies for enhancing energy facilities and services:

AIR QUALITY SECTION

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **air quality** (see 301 CMR 11.03(8))? ___ Yes **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **air quality**? ___ Yes **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Solid and Hazardous Waste Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Air Quality Section below.

II. Impacts and Permits

A. Does the project involve construction or modification of a major stationary source (see 310 CMR 7.00, Appendix A)? ___ Yes ___ No; if yes, describe existing and proposed emissions (in tons per day) of:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Particulate matter	_____	_____	_____
Carbon monoxide	_____	_____	_____
Sulfur dioxide	_____	_____	_____
Volatile organic compounds	_____	_____	_____
Oxides of nitrogen	_____	_____	_____
Lead	_____	_____	_____
Any hazardous air pollutant	_____	_____	_____
Carbon dioxide	_____	_____	_____

B. Describe the project's other impacts on air resources and air quality, including noise impacts:

III. Consistency

A. Describe the project's consistency with the State Implementation Plan:

B. Describe measures that the proponent will take to comply with other federal, state, regional, and local plans and policies related to air resources and air quality:

SOLID AND HAZARDOUS WASTE SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **solid or hazardous waste** (see 301 CMR 11.03(9))? ___ Yes X **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **solid and hazardous waste**? ___ Yes X **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Historical and Archaeological Resources Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Solid and Hazardous Waste Section below.

II. Impacts and Permits

A. Is there any current or proposed facility at the project site for the storage, treatment, processing, combustion or disposal of solid waste? ___ Yes ___ No; if yes, what is the volume (in tons per day) of the capacity:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Storage	_____	_____	_____
Treatment, processing	_____	_____	_____
Combustion	_____	_____	_____
Disposal	_____	_____	_____

B. Is there any current or proposed facility at the project site for the storage, recycling, treatment or disposal of hazardous waste? ___ Yes ___ No; if yes, what is the volume (in tons or gallons per day) of the capacity:

	<u>Existing</u>	<u>Change</u>	<u>Total</u>
Storage	_____	_____	_____
Recycling	_____	_____	_____
Treatment	_____	_____	_____
Disposal	_____	_____	_____

C. If the project will generate solid waste (for example, during demolition or construction), describe alternatives considered for re-use, recycling, and disposal:

D. If the project involves demolition, do any buildings to be demolished contain asbestos?
___ Yes ___ No

E. Describe the project's other solid and hazardous waste impacts (including indirect impacts):

III. Consistency

Describe measures that the proponent will take to comply with the State Solid Waste Master Plan:

HISTORICAL AND ARCHAEOLOGICAL RESOURCES SECTION

I. Thresholds / Impacts

A. Have you consulted with the Massachusetts Historical Commission? ___ Yes X **No (planned but not yet sent)**; if yes, attach correspondence. For project sites involving lands under water, have you consulted with the Massachusetts Board of Underwater Archaeological Resources? ___ Yes X **No (planned but not yet sent)**; if yes, attach correspondence

B. Is any part of the project site a historic structure, or a structure within a historic district, in either case listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___ Yes X **No**; if yes, does the project involve the demolition of all or any exterior part of such historic structure? ___ Yes ___ No; if yes, please describe:

C. Is any part of the project site an archaeological site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ___ Yes X **No**; if yes, does the project involve the destruction of all or any part of such archaeological site? ___ Yes ___ No; if yes, please describe:

D. If you answered "No" to all parts of both questions A, B and C, proceed to the **Attachments and Certifications** Sections. If you answered "Yes" to any part of either question A or question B, fill out the remainder of the Historical and Archaeological Resources Section below.

II. Impacts

Describe and assess the project's impacts, direct and indirect, on listed or inventoried historical and archaeological resources:

See Attachment B: Supplemental Narrative

III. Consistency

Describe measures that the proponent will take to comply with federal, state, regional, and local plans and policies related to preserving historical and archaeological resources:

See Attachment B: Supplemental Narrative

CLIMATE CHANGE ADAPTATION AND RESILIENCY SECTION

This section of the Environmental Notification Form (ENF) solicits information and disclosures related to climate change adaptation and resiliency, in accordance with the MEPA Interim Protocol on Climate Change Adaptation and Resiliency (the “MEPA Interim Protocol”), effective October 1, 2021. The Interim Protocol builds on the analysis and recommendations of the 2018 Massachusetts Integrated State Hazard Mitigation and Climate Adaptation Plan (SHMCAP), and incorporates the efforts of the Resilient Massachusetts Action Team (RMAT), the inter-agency steering committee responsible for implementation, monitoring, and maintenance of the SHMCAP, including the “Climate Resilience Design Standards and Guidelines” project. The RMAT team recently released the RMAT Climate Resilience Design Standards Tool, which is available [here](#).

The MEPA Interim Protocol is intended to gather project-level data in a standardized manner that will both inform the MEPA review process and assist the RMAT team in evaluating the accuracy and effectiveness of the RMAT Climate Resilience Design Standards Tool. Once this testing process is completed, the MEPA Office anticipates developing a formal Climate Change Adaptation and Resiliency Policy through a public stakeholder process. Questions about the RMAT Climate Resilience Design Standards Tool can be directed to rmat@mass.gov.

All Proponents must complete the following section, referencing as appropriate the results of the output report generated by the RMAT Climate Resilience Design Standards Tool and attached to the ENF. In completing this section, Proponents are encouraged, but not required at this time, to utilize the recommended design standards and associated Tier 1/2/3 methodologies outlined in the RMAT Climate Resilience Design Standards Tool to analyze the project design. However, Proponents are requested to respond to a respond to a [user feedback survey](#) on the RMAT website or to provide feedback to rmat@mass.gov, which will be used by the RMAT team to further refine the tool. Proponents are also encouraged to consult general guidance and best practices as described in the [RMAT Climate Resilience Design Guidelines](#).

Climate Change Adaptation and Resiliency Strategies

- I. Has the project taken measures to adapt to climate change for all of the climate parameters analyzed in the RMAT Climate Resilience Design Standards Tool (sea level rise/storm surge, extreme precipitation (urban or riverine flooding), extreme heat)? ___Yes **No**

Note: Climate adaptation and resiliency strategies include actions that seek to reduce vulnerability to anticipated climate risks and improve resiliency for future climate conditions. Examples of climate adaptation and resiliency strategies include flood barriers, increased stormwater infiltration, living shorelines, elevated infrastructure, increased tree canopy, etc. Projects should address any planning priorities identified by the affected municipality through the Municipal Vulnerability Preparedness (MVP) program or other planning efforts, and should consider a flexible adaptive pathways approach, an adaptation best practice that encourages design strategies that adapt over time to respond to changing climate conditions. General guidance and best practices for designing for climate risk are described in the [RMAT Climate Resilience Design Guidelines](#).

A. If no, explain why. See Attachment B: Supplemental Narrative and Attachment N: RMAT Report.

B. If yes, describe the measures the project will take, including identifying the planning horizon and climate data used in designing project components. If applicable, specify the return period and design storm used (e.g., 100-year, 24-hour storm).

C. Is the project contributing to regional adaptation strategies? ___ Yes No; If yes, describe.

II. Has the Proponent considered alternative locations for the project in light of climate change risks?
 Yes ___ No

A. If no, explain why.

B. If yes, describe alternatives considered.

See Attachment B: Supplemental Narrative

III. Is the project located in Land Subject to Coastal Storm Flowage (LSCSF) or Bordering Land Subject to Flooding (BLSF) as defined in the Wetlands Protection Act? Yes ___ No

If yes, describe how/whether proposed changes to the site's topography (including the addition of fill) will result in changes to floodwater flow paths and/or velocities that could impact adjacent properties or the functioning of the floodplain. General guidance on providing this analysis can be found in the CZM/MassDEP Coastal Wetlands Manual, available [here](#).

The proposed project is focused on maintaining and restoring existing navigational channels to maintain safe boating routes. As such, no impacts on floodwater flow paths or velocities are expected.

ENVIRONMENTAL JUSTICE SECTION

I. Identifying Characteristics of EJ Populations

- A. If an Environmental Justice (EJ) population has been identified as located in whole or in part within 5 miles of the project site, describe the characteristics of each EJ populations as identified in the EJ Maps Viewer (i.e., the census block group identification number and EJ characteristics of "Minority," "Minority and Income," etc.). Provide a breakdown of those EJ populations within 1 mile of the project site, and those within 5 miles of the site.

Within 1 mile: No EJ populations

Within 5 miles: Block Group 2, Tract 9502.02 (Minority); Block Group 2, Tract 9502.01 (Minority); Block Group 1, Tract 9502.02 (Minority); Block Group 1, Tract 9502.01 (Minority); Block Group 1, Tract 9504 (Minority); Block Group 2, Tract 9504 (Minority)

- B. Identify all languages identified in the "Languages Spoken in Massachusetts" tab of the EJ Maps Viewer as spoken by 5 percent or more of the EJ population who also identify as not speaking English "very well." The languages should be identified for each census tract located in whole or in part within 1 mile and 5 miles of the project site, regardless of whether such census tract contains any designated EJ populations.

Within 1 mile: no tracts identified in "Languages Spoken in MA" map

Within 5 miles: Tract 9504 (Spanish or Spanish Creole: 9.2%)

- C. If the list of languages identified under Section I.B. has been modified with approval of the EEA EJ Director, provide a list of approved languages that the project will use to provide public involvement opportunities during the course of MEPA review. If the list has been expanded by the Proponent (without input from the EEA EJ Director), provide a list of the additional languages that will be used to provide public involvement opportunities during the course of MEPA review as required by Part II of the MEPA Public Involvement Protocol for Environmental Justice Populations ("MEPA EJ Public Involvement Protocol"). If the project is exempt from Part II of the protocol, please specify.

This project does not meet or exceed the MEPA review thresholds at 301 CMR 11.03(8)(a) and (b) and does not generate >150 new adt of diesel vehicle traffic over at least a year. Therefore, the designated geographic area with respect to EJ Populations is one (1) mile. No EJ populations occur within one (1) mile of the proposed project areas. Additionally, no census tracts where at least 5% of the population has speakers who report they do not speak English "very well" were identified within one (1) mile of the proposed project area. Therefore, no additional public involvement opportunities are required per 301 CMR 11.05(4).

II. Potential Effects on EJ Populations

- A. If an EJ population has been identified using the EJ Maps Viewer within 1 mile of the project site, describe the likely effects of the project (both adverse and beneficial) on the identified EJ population(s).

The project site is not located within 1 mile of an EJ population.

- B. If an EJ population has been identified using the EJ Maps Viewer within 5 miles of the project site, will the project: (i) meet or exceed MEPA review thresholds under 301 CMR 11.03(8)(a)-(b) ___ Yes **X** **No**; or (ii) generate 150 or more new average daily trips (adt) of diesel vehicle traffic, excluding public transit trips, over a duration of 1 year or more. ___ Yes **X** **No**

- C. If you answered “Yes” to either question in Section II.B., describe the likely effects of the project (both adverse and beneficial) on the identified EJ population(s).

III. Public Involvement Activities

- A. Provide a description of activities conducted prior to filing to promote public involvement by EJ populations, in accordance with Part II of the MEPA EJ Public Involvement Protocol. In particular:
1. If advance notification was provided under Part II.A., attach a copy of the Environmental Justice Screening Form and provide list of CBOs/tribes contacted (with dates). Copies of email correspondence can be attached in lieu of a separate list.
 2. State how CBOs and tribes were informed of ways to request a community meeting, and if any meeting was requested. If public meetings were held, describe any issues of concern that were raised at such meetings, and any steps taken (including modifications to the project design) to address such concerns.
 3. If the project is exempt from Part II of the protocol, please specify.
This project does not meet or exceed the MEPA review thresholds at 301 CMR 11.03(8)(a) and (b) and does not generate >150 new adt of diesel vehicle traffic over at least a year. Therefore, the designated geographic area with respect to EJ Populations is one (1) mile. No EJ populations occur within one (1) mile of the proposed project areas. Additionally, no census tracts where at least 5% of the population has speakers who report they do not speak English “very well” were identified within one (1) mile of the proposed project area. Therefore, no additional public involvement opportunities are required per 301 CMR 11.05(4).
- B. Provide below (or attach) a distribution list (if different from the list in Section III.A. above) of CBOs and tribes, or other individuals or entities the Proponent intends to maintain for the notice of the MEPA Site Visit and circulation of other materials and notices during the course of MEPA review.
N/A, see above.
- C. Describe (or submit as a separate document) the Proponent’s plan to maintain the same level of community engagement throughout the MEPA review process, as conducted prior to filing.
N/A, see above.

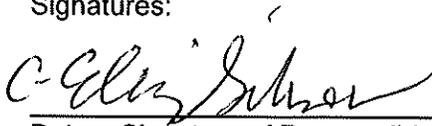
CERTIFICATIONS:

1. The Public Notice of Environmental Review has been/will be published in the following newspapers in accordance with 301 CMR 11.15(1):

(Name) The Inquirer and Mirror (Date) _____

2. This form has been circulated to Agencies and Persons in accordance with 301 CMR 11.16(2).

Signatures:



January 29, 2026

Date Signature of Responsible Officer
or Proponent

Date Signature of person preparing
ENF (if different from above)

C. Elisabeth Gibson

Doug Partridge

Name (print or type)

Name (print or type)

Town of Nantucket

Arcadis U.S., Inc

Firm/Agency

Firm/Agency

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Street

Street

Nantucket, MA, 02554

Wakefield, MA, 01880

Municipality/State/Zip

Municipality/State/Zip

508.228.7200

781.224.4488

Phone

Phone

Attachment B

Supplemental Narrative

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Attachment B. Supplemental Narrative (this document)

Attachment C. Figures

Attachment D. MassDEP 2016 Approvals

Attachment E. Site Photographs

Attachment F. FEMA FIRM Panels

Attachment G. Sediment Analysis

Attachment H. Eelgrass Findings

Attachment I. NHESP Letter

Attachment J. Post Dredge Backfill Rate Analysis

Attachment K. Preliminary Project Drawings

Attachment L. Town Notice

Attachment M. MEPA Distribution List

Attachment N. RMA Climate Resilience Design Standards Report

Acronyms and Abbreviations

ACEC	Area of Critical Environmental Concern
BMP	Best Management Practice
CN	Control Number
CY	Cubic Yards
CZM	Coastal Zone Management
DGA	Designated Geographic Area
DPH	Department of Public Health
EEA	Energy & Environmental Affairs
EIR	Environmental Impact Report
EJ	Environmental Justice
ENF	Environmental Notification Form
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
H&H	Hydraulics and Hydrology
MA	Massachusetts
MA DMF	Massachusetts Division of Marine Fisheries
MassDEP	Massachusetts Department of Environmental Protection
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
MESA	Massachusetts Endangered Species Act
MHC	Massachusetts Historical Commission
MHHW	Mean Higher High Water
MHW	Mean High Water
MLLW	Mean Lower Low Water
MLW	Mean Low Water
MSL	Mean Sea Level
MWPA	Massachusetts Wetlands Protection Act
NAVD88	North American Vertical Datum of 1988
NHESP	National Heritage & Endangered Species Program
NOAA	National Oceanic and Atmospheric Administration

NOI	Notice of Intent
Project	proposed project work
RMAT	ResilientMass Action Team
sf	square feet
SHPO	State Historic Preservation Officer
THPO	Tribe Historic Preservation Officer
TMDL	Total Maximum Daily Loads
UTM	Universal Transverse Mercator
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WPA	Wetlands Protection Act

Attachment B. Supplemental Narrative

1 Introduction

The Town of Nantucket (Town) is seeking regulatory approvals and associated permits to complete maintenance dredging to support navigation of both private and commercial boats over a period of ten years at two locations on the island of Nantucket (hereafter Project):

- Polpis Harbor with coordinates at 41.304457 latitude and -70.021136 longitude
- Hither Creek with coordinates at 41.274393 latitude and -70.201726 longitude

All coordinates above and throughout the document are provided in Universal Transverse Mercator (UTM) NAD83, UTM Zone 19. USGS site location maps are included as **Figure 1A and 1B of Attachment C¹**, and existing conditions site maps are included as **Figures 2A and 2B (Attachment C)**.

The objective of the proposed improvement dredging is to restore and improve navigation for recreational and commercial boating, improve tidal flushing, and maintain access to public boat ramps, landings, mooring fields, boat marinas, and shellfish areas. The Town has historically completed dredging across the island to maintain navigational routes for boats. Maintenance dredge projects were previously completed in collaboration with Massachusetts Department of Environmental Management (the precursor to the Massachusetts Department of Environmental Protection [MassDEP]), Office of Waterways. Consistent with past dredging efforts in Polpis Harbor, dredge material yielded from this proposed project will be stored at upland locations and will be maintained by the Town as a sand bank to support beneficial re-use targeted at coastal resiliency throughout the island. Any future beneficial re-use project is understood to require separate regulatory reviews and approvals to support these assumed independent projects.

This supplemental narrative (Report) is intended to support a Massachusetts Environmental Policy Act (MEPA) review, and specifically the submittal of an Environmental Notification Form (ENF) that is included as **Attachment A**. The ENF was determined to be necessary because the proposed project involves dredging more than 10,000 cubic yards of sand combined from both Polpis Harbor and Hither Creek. The purpose of this Report is to provide supplemental information to the ENF form about the proposed project. This report is also intended to document minimization and avoidance of environmental resources that may occur on or proximate to the proposed project.

To support the MEPA review, this supplemental narrative includes a description of the following:

- Description of proposed project activities and anticipated impacts.
- Site characterization of existing conditions and land uses.
- Evaluation of project alternatives; and
- Summary of required regulatory compliance with federal, state and/or local regulations.

¹ All references to appendices are for the overall MEPA application.

1.1 Required Regulatory Approvals

In addition to this MEPA Environmental Notification Certificate, the applicant is filing for several other approvals and permits at the local, state, and federal level. These include:

- U.S. Army Corps of Engineers (USACE) Individual Permit under Section 404 of Clean Water Act and Section 10 of the Rivers & Harbors Act
 - Formal Consultation with U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA)
 - Formal Consultation with National Oceanic and Atmospheric Administration (NOAA) under Section 7 of ESA and Magnusson-Stevens Act
 - State Historic Preservation Officer (SHPO) consultation in accordance with Section 106 Regulations. This includes Massachusetts Historical Commission (MHC), Board of Underwater Archaeological Resources, Wampanoag Tribe of Gay Head (Aquinnah) Tribal Historic Preservation Officer (THPO) and Mashpee Wampanoag THPO
- Notice to Mariners Permit from U.S. Coast Guard
- Coastal Zone Management Federal Consistency
- MassDEP Water Quality Certification under Section 401 of the Clean Water Act
- MassDEP Chapter 91 License in accordance with 310 CMR 9.13(5)
- MassDEP and Town of Nantucket Notice of Intent (NOI)
- Natural Heritage & Endangered Species Program (NHESP) Streamlined Massachusetts Endangered Species Act (MESA) / Wetlands Protection Act (WPA) Review

1.2 Historic Dredging Activities

Maintenance dredging to support navigation has historically occurred in both Polpis Harbor and Hither Creek, as outlined in **Table 1**². The proposed project is assumed as improvement dredging at both locations based upon the definition provided at 310 CMR 13.02. The project is assuming dredging will be defined as improvement, and not maintenance, based upon the following:

- Polpis Harbor –The proposed dredging channel remains fairly consistent with previous permits. However, the proposed dredge footprint has been modified slightly to reflect current bathymetric conditions and minimize required dredging. In addition, the project extends the original dredge depth with up to 2 feet of overdredge. This is intended to reduce the frequency of maintenance dredging required within the ten-year period.
- Hither Creek – The proposed channel does not appear to have been dredged within the past twenty years based upon records (**Table 1**). The proposed dredge footprint is based upon both bathymetry, appropriate morphology to support marine navigation of both commercial and recreational boat traffic, and access to public water access points.

² The Town will continue to work with MASSDEP to update records of past dredging where applicable.

Table 1. Summary of Past Dredging Efforts

Location	Year	Dredging Purpose	Volume (cubic yards)	Associated Dredge Plans*
Polpis Harbor	1940	Create Channel	Unknown	NA
	1965	Maintenance	32,500	Division of Waterways, Contract No. 2468.
	1992-1993	Maintenance	32,500	Office of Waterways, Contract No. 3253.
	2017	Maintenance	69,039	?
Madaket Harbor and Hither Creek	1965	Create Channel and Mooring Basin	30,963	?
	1970	Maintenance	43,723	?
	1985	New Channel Location	34,570	?

*If available.

NA = Not available

1.3 Past Regulatory Approvals

As noted in Section 1.2, this project is proposing improvement dredging for existing navigational channels within both Polpis Harbor and Hither Creek. Dredging is required to maintain navigational access for both recreational and commercial boats. As such, this MEPA ENF submittal reflects an approach that is consistent and parallel with past MEPA ENF Certificates associated with dredging to maintain navigation.

Regulatory approvals issued for the 1993 dredging in Polpis Harbor include:

- MEPA ENF Certificate (EOEA #8868), 12/05/91
- Order of Conditions (DEP No. SE48-699), 02/21/92
- MADEP Water Quality Certification (#21929), 05/29/92 (revised 03/08/93)
- MADEP Chapter 91 Permit (#229), 07/02/92
- USACE Permit (1991-02370), 06/01/92

Regulatory approvals issued for the 2016 dredging in Polpis Harbor include:

- MEPA ENF Certificate (EOEA #15241), 09/05/14 (Revised 03/11/16)
- Order of Conditions (DEP No. SE48-2866), 03/23/16
- MADEP Water Quality Certification (#X269790), 10/04/16
- MADEP Chapter 91 Permit (#14251), 10/04/16
- USACE Permit (NAE-2014-01550), 09/09/16

The ENF Certificate and other associated approvals from MassDEP which approved the 2016 dredging are included as **Attachment D** of the overall submittal. The past ENF Certificate recognized the need for regular maintenance dredging within Polpis Harbor and the Town's responsible sediment management. They also recognized the need for temporary sand bank locations as discussed below, and which were the first approved in the state.

A key feature of Nantucket's past and proposed dredging projects is the use of upland sand banks for the temporary storage of dredged material. Rather than immediate beneficial re-use, the sand bank approach has allowed the Town to stockpile high-quality dredged sand for future coastal resiliency and nourishment projects, subject to separate regulatory review and approval. This practice has been previously authorized under MEPA ENF Certificates and continues to be an integral part of Nantucket's sediment management strategy. By maintaining a sand bank, the Town ensures flexibility in responding to future coastal protection needs while adhering to all environmental and regulatory safeguards. The ENF process has historically recognized and endorsed this approach, confirming its effectiveness and compliance within the broader framework of environmental management.

1.4 Potential Beach Nourishment and Dune Restoration Locations

At this time, the Town has not identified final beach nourishment and dune restoration locations that will utilize the proposed dredge sediments. This is the result of both planning and funding not being at a stage to finalize these locations. As such, and as discussed above, this MEPA ENF specifically includes a selection of potential sand bank locations that will temporarily hold the dredge sediments.

However, consistent with pre-application meetings with MEPA staff, the Town recognizes the importance of identifying potential beneficial beach nourishment and dune restoration locations. Preliminary locations are identified in Nantucket's Coastal Resilience Plan (2021) and include:

- North Shore - Jetties to Eel Point
- Children's Beach
- Coataue between Five Fingered Point and Bass Point and between First Point and Second Point
- Sconset Bluffs
- Codfish Park
- Ames Avenue Bridge
- Nantucket Memorial Airport
- Surfside Wastewater Treatment Facility
- Tom Nevers Field

The Town recognized that any beneficial beach nourishment and dune restoration will require a separate MEPA review, as well as other regulatory permits. Given the preliminary stage of planning and funding to support future beneficial reuse projects which will be focused on island resiliency to sea level rise and coastal beach erosion, the Town has offered this preliminary list of potential locations.

1.5 Statement of Need

Initial improvement dredging followed by maintenance dredging for a period of ten years is required at both Polpis Harbor and Hither Creek to restore navigation for recreational and commercial boating,

improve tidal flushing, and maintain access to public boat ramps, landings, mooring fields, boat marinas, and shellfish areas. These two locations were selected based upon past precedent and history of dredging to support navigation at both locations, hydraulic and hydrologic (H&H) analysis and associated sediment transport modeling, as well as comprehensive stakeholder outreach. Without this project, both commercial and recreational boating would be limited within both Polpis Harbor and Hither Creek. This project also provides direct benefits to the Town for future resiliency efforts that are intended to utilize the dredge material.

2 Site Characterization

2.1 Dredge Locations - Polpis Harbor and Hither Creek

Polpis Harbor is located approximately 3 miles northeast of the entrance to Nantucket Harbor and approximately 2 miles south of the Head of the Harbor. Polpis Harbor is an active waterfront utilized by recreational and commercial vessels. Due to its geographic location, Polpis Harbor has also been used as a storm refuge for boaters. The harbor currently provides 244 moorings for vessels up to approximately 26 feet in length. It is also used by the Nantucket Community Sailing Program, which offers a full range of private and group sailing programs for all ages. Vessel access and navigational safety in and out of the harbor is presently compromised due to significant shoaling and sediment build up that has occurred within the mouth of the channel. This sediment build up has occurred since the last dredging in 2016. Existing water depths within the authorized channel in the vicinity of Quaise Point range from approximately 0 to -10 feet North American Vertical Datum of 1988 (NAVD88).

Hither Creek is located approximately 2.5 miles southeast of the entrance to Madaket Harbor, in between Little Neck and Jackson Point. Hither Creek is actively utilized by recreational and commercial vessels. Several private landowners utilize the creek via private docks and moorings. A public access boat slip is located on the southeastern shore of Hither Creek, and a marina is located at the northeast corner. Vessel access and navigational safety is presently compromised due to significant sediment build up that has occurred within the channel. No known dredging has occurred within Hither Creek since the 1980's. Existing water depths within the channel range from -3 to -8 feet NAVD88.

Site photographs are included as **Attachment E** of the overall permit package.

2.1.1 Tidal Hydrology

Proposed dredge locations are both located within tidal waterbodies. Tidal datums for both proposed dredge sites are derived from NOAA Station 8449130 Nantucket Island, are as follows (all elevations reported in NAVD88):

- Mean Higher High Water (MHHW) = +1.513 feet
- Mean High Water (MHW) = +1.183 feet
- Mean Sea Level (MSL) = - 0.287 feet
- Mean Low Water (MLW) = -1.857 feet
- Mean Lower Low Water (MLLW) = -2.057 feet

2.1.2 Wetland Resource Areas and Buffers

Coastal wetland resource areas at the proposed dredge locations were identified through the review of 310 CMR 10.21 through 10.37, 310 CMR 9.00, Town Regulation Chapter 390, and MassMapper (MassGIS 2025). The results are summarized below.

2.1.2.1 Land Under the Ocean

The landward boundary of this wetland resource area is located at MLW, which was determined to be -1.857 feet NAVD88. All proposed Project activities are located below MLW and therefore occur within Land Under the Ocean.

2.1.2.2 Land Containing Shellfish

310 CMR 10.34 establishes regulations for projects which will affect land containing shellfish. Land containing shellfish means land under the ocean, tidal flats, rocky intertidal shores, salt marshes, and land under salt ponds when any such land contains shellfish. The entirety of both proposed dredging areas is located within mapped shellfish suitability areas based on maps provided by the Massachusetts Division of Marine Fisheries (MA DMF). Specifically, both dredging areas are considered suitable area for bay scallops (*Argopecten irradians*) and quahogs (*Mercenaria mercenaria*).

It is noted that the MA DMF has designated Hither Creek as “prohibited” shellfish growing area in accordance with the National Shellfish Sanitation Program. Polpis Harbor is designated as an “approved” shellfish growing area.

2.1.2.3 Land under the Ocean that Underlies a Diadromous Fish Run

310 CMR 10.35 establishes regulations for projects which will affect banks of or land under the ocean, ponds, streams, rivers, lakes, or creeks that underlie an anadromous or catadromous (collectively, “diadromous”) fish run (“fish run”). Fish runs are mapped by the Coastal Zone Management (CZM) Program. According to MassMapper, there is a fish run originating in Long Pond (a diadromous spawning habitat upstream of Hither Creek) that travels downstream along Hither Creek and ends in the Madaket Harbor. Although no species are listed for this fish run, both river herring (*Alosa sp.*) and American eel (*Anguilla rostrata*) have been recorded upstream of the project area. Therefore, the Hither Creek project area is located within diadromous fish habitat.

2.1.2.4 Land Subject to Coastal Storm Flowage

Land subject to coastal storm flowage means land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater. The entire proposed dredging footprint is located below MLW, within areas permanently inundated.

The Polpis Harbor Site is located within the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel 25019C0092G, effective 6/9/2014. All dredging activities are anticipated to occur either within the Zone AE flood hazard area with a base flood elevation of -9 feet NAVD88 or within the Zone VE flood hazard area with a base flood elevation of -10 feet NAVD88.

The Hither Creek Site is located with the FEMA FIRM panel 25019C0064G, effective 6/9/2014. All dredging activities are anticipated to occur either within the Zone AE flood hazard area with a base flood elevation of -8 feet NAVD88 or within the Zone VE flood hazard area with a base flood elevation of -9 feet NAVD88. The site is located within an Otherwise Protected Area (OPA), defined as an undeveloped coastal area.

FEMA FIRM Panels are also included as **Attachment F**.

2.1.3 Sediments

Sediment grain analysis was performed in Polpis Harbor in 2014. A total of nine (9) vibracore samples were characterized as predominantly medium to coarse sand, with a fines content of 0.7 to 3.5 percent.

Core sediment samples were collected in Polpis Harbor and Madaket Harbor in 2023 to determine the subsurface soil type and grain size. A total of fifteen (15) samples were collected in Madaket Harbor and two (2) samples were collected in Polpis Harbor. All samples collected were determined to be sands with less than 10% passing the number 200 sieve.

To supplement this maintenance dredge proposal, additional core sediment samples were collected in both Polpis Harbor and Hither Creek in the fall of 2025. Specifically, 5 samples were collected in Hither Creek and 2 samples were collected in Polpis Harbor. A map of sediment samples at each site is included as **Figure 3A and 3B**. Data is provided as **Attachment G**.

Results of the 2025 sampling are summarized as follows:

- The sample at the mouth of Polpis Harbor indicated fine sands to depths of five and a half feet below the sediment surface. Results showed 0.5% passing the No. 200 sieve. A second sample was taken in the southern extent of the dredge profile and demonstrated approximately 50% fines passing through a No. 200 sieve.
- The five samples showed a variation between silty sands and sands, and reflective of organic deposition within Hither Creek. All samples demonstrated sands generally starting at a depth of 2 feet and overlaid in multiple locations by silty sands.

Consistent with MassDEP's *Guide to Best Management Practices (BMP) for Beach Nourishment Projects in Massachusetts* (2007), a sediment source is considered suitable for nourishment provided the material is clean and has a grain size distribution similar to or slightly coarser than the average grain size distribution of existing beach sediments. Compatibility with permitted beach nourishment sites will be verified prior to selling or placing dredge sediments at nourishment projects located across the island.

The Town will continue to work with MassDEP to evaluate the need for additional chemical sampling. However, it is noted that the proposed dredging will stockpile sediments temporarily at an inland sand bank location and does not include placement into regulated waters or wetlands. It also is recognized that the majority of Polpis Harbor sediments demonstrates sands containing between 0.5 and 3 percent passing the No. 200 sieve and as such not requiring additional chemical sampling in accordance with 314 CMR 9.07(2)(a). Hither Creek is more depositional, and silty sands were documented throughout the footprint. It is recognized additional sampling will be required, and Town will continue to work with MassDEP to define the appropriate time and location for this sampling.

2.1.4 Eelgrass

The only applicable vegetation that may occur within the proposed dredging footprint includes seagrasses; primarily eelgrass (*Zostera marina*). First, existing Massachusetts eelgrass mapping layers were evaluated for proximity to the project. This data was then reviewed and refined based on an analysis of project specific April 2023 aerial imagery. Preliminary mapping of eelgrass is provided in **Figures 4A and 4B**.

To support and verify this mapping, field surveys were conducted by CR Environmental in September 2025 focusing on the proposed dredging footprints. These surveys followed recommended methodologies

outlined in the Massachusetts Technical Report TR-43 “*Technical Guidelines for the Delineation, Restoration, and Monitoring of Eelgrass (Zostera marina) in Massachusetts Coastal Waters*”.

The 2025 eelgrass survey utilized acoustic mapping and underwater video ground-truthing in both Polpis Harbor and Hither Creek. Results confirmed that eelgrass is largely absent from the proposed dredge footprints in both locations. In Polpis Harbor, eelgrass was observed only outside the active dredge channel, with sparse encroachment noted at a single location along the southern edge of the footprint. In Hither Creek, little to no eelgrass was documented within the dredge footprint, with only trace blades found at two transects. Most healthy eelgrass meadows were found adjacent to, but not within, the areas proposed for dredging. These findings are consistent with previous mapping and indicate that the proposed dredge plan will entirely avoid impacts to existing eelgrass habitat. A formal report of these findings is included as **Attachment H**.

2.1.5 Massachusetts Threatened and Endangered Species

The entire project dredging footprint occurs within both State of Massachusetts EH (EH #1365) and PH (PH #888) as designated by the latest map revisions issued (August 1, 2021) by the Massachusetts NHESP. Maps of these habitat areas relative to the proposed project areas are included as **Figures 5A and 5B**. It is noted that the project is therefore subject to MESA review.

A July 15, 2025 letter from NHESP (**Attachment I**) confirms that two (2) state listed threatened and endangered species are associated with the EH and PH mapped at the project area (**Table 2**). It is recognized that both of these species are federally protected as well and will be similarly addressed in the federal wetlands permit to be submitted to USACE subsequent to this ENF. In addition, NHESP also recognizes the potential habitat for two species of special concern and are also identified in **Table 2**.

Table 2. Rare Species Identified by NHESP with Potential to Occur Proximate to the Project Areas

Scientific Name	Common Name	Taxonomic Group	State Status	Habitat(s)*	EH	PH
<i>Sterna dougallii</i>	Roseate tern	Bird	Endangered	Sandy, gravelly, or rocky islands; barrier beaches; prefers dense vegetation	1365	888
<i>Sterna hirundo</i>	Common tern	Bird	Special Concern	Sandy, gravelly, or cobbly islands; barrier beaches; salt marshes; manmade infrastructure; prefers scattered vegetation	1365	888
<i>Sternula antillarum</i>	Least tern	Bird	Special Concern	Sandy and gravelly beaches with limited vegetation; dredge spoils	1365	888
<i>Charadrius melodus</i>	Piping plover	Bird	Threatened	Flat, sandy coastal beaches with sparse vegetation	1365	888

*Habitat information provided by NHESP fact sheets available at www.mass.gov/nhesp.

Each state-listed species is summarized below in terms of potential impact of the proposed project:

Roseate tern – Associated with islands and barrier beaches with a preference for dense vegetation. The project areas are completely submerged and are not vegetated; suitable habitat for the roseate tern is not likely to occur within the project areas. It is recognized that foraging habitat may occur proximate to the proposed dredging locations. However, conservation measures associated with the project that restrict dredging to the winter months will avoid impacts to this migratory bird.

Common tern – Associated with islands, barrier beaches, and built infrastructure with a preference for scattered vegetation. The project areas are completely submerged and are not vegetated. Additionally, no built infrastructure will be created, removed, or modified as part of this project. Therefore, suitable habitat for the common tern is not likely to occur within the project areas. It is recognized that suitable nesting and/or foraging habitat may occur proximate to the proposed project area. However, conservation measures associated with the project that restrict dredging to the winter months will avoid impacts to this migratory bird.

Least tern – Associated with beaches and dredge spoils with a preference for limited vegetation. The project areas are completely submerged. Therefore, suitable habitat for the least tern is not likely to occur within the project areas. It is recognized that suitable nesting and/or foraging habitat may occur proximate to the proposed project area. However, conservation measures associated with the project that restrict dredging to the winter months will avoid impacts to this migratory bird.

Piping plover – Associated with beaches with a preference for sparse vegetation. The project areas are completely submerged and are not vegetated; suitable habitat for the piping plover is not likely to occur within the project areas. It is recognized that suitable nesting and/or foraging habitat may occur proximate to the proposed project area. However, conservation measures associated with the project that restrict dredging to the winter months will avoid impacts to this migratory bird.

2.1.6 Areas of Critical Environmental Concern

Areas of Critical Environmental Concern (ACECs) are designated to protect wetland resources, wildlife habitat, and scenic recreational areas under 301 CMR 12.00 ACEC and 301 CMR 11.00 MEPA Regulations. No ACECs are mapped at the Site.

2.1.7 Commonwealth Tidelands

Commonwealth tidelands exist within the entirety of both project areas in the form of historically filled, and flowed, tidelands (salt marsh) that are protected under M.G.L. Chapter 91; the Public Waterfront Act and associated waterways regulations (310 CMR 9.00). Known previous Chapter 91 licenses associated with dredging within both Polpis Harbor and Hither Creek are summarized below:

- Polpis Harbor:
 - 1993 Dredging: Chapter 91 License #229, issued 07/02/92
 - 2016 Dredging: Chapter 91 License #14251, issued 10/04/16
- Hither Creek:
 - No licenses were identified during a web and file review. Previous dredging efforts are summarized in **Table 1**.

As noted above, application for a MassDEP Chapter 91 License in accordance with 310 CMR 9.13(5) is anticipated following this MEPA review.

2.1.8 Cultural and Historic Resources

The project that includes only improvement and maintenance dredging in existing navigational channels is not expected to impact any historical or archaeological properties. Consultation letters have been submitted to the Massachusetts Historical Commission, Board of Underwater Archaeological Resources, the Wampanoag Tribe of Gay Head (Aquinnah) THPO and Mashpee Wampanoag THPO.

It is noted that the entire island of Nantucket, including the two proposed dredging areas, is designated under the National Register of Historic Places as a National Historic Landmark and a Local Historic District. However, regulatory coordination with MHC for past dredging projects in Polpis Harbor found that the proposed dredging is unlikely to affect significant historic or archaeological resources. Similar regulatory coordination for this project is discussed in **Section 5.1.2**.

2.1.9 Environmental Justice Populations

Based on a review of the MassGIS Environmental Justice data, the proposed dredging locations are not located within any Environmental Justice (EJ) populations. It is noted that six census blocks on the south shore of Nantucket are designated as EJ populations based on their consistency with the criteria for minority status (see **Figure 6**). These populations are located more than 1 mile but less than 5 miles from the proposed project areas and are not within the project's EJ Designated Geographic Area (DGA).

The populations are not expected to be adversely impacted by the project; in fact, they are expected to benefit by the project in the long run by support of future island resiliency projects.

2.1.10 Total Maximum Daily Load Restrictions

Based on a review of MassDEP mapping, both project areas are subject to Total Maximum Daily Load (TMDL) restrictions enacted by MassDEP under 314 CMR 4, which limit pollutants to the waterbodies to prevent them from becoming impaired.

It is noted that Polpis Harbor is subject to two (2) TMDL restrictions as identified by MassDEP. The TMDLs for the project area are summarized as follows:

- Final Pathogen TMDL for the Islands Watershed – Control Number (CN) 254.1, approved by EPA 2020, preventative TMDL for enterococci
- Nantucket Harbor Embayment System TMDLs For Nitrogen (Total) – CN 249.0, approved by EPA 2009, restorative TMDL for nitrogen

Hither Creek is also subject to a TMDL restriction identified by MassDEP:

- Final Nitrogen TMDL for Madaket Harbor/Long Pond – CN 283.0, approved by EPA 2015, restorative TMDL for nitrogen (total)

2.1.11 Massachusetts Ocean Sanctuaries

The Massachusetts Ocean Sanctuaries Act established five ocean sanctuaries in state waters and defines both prohibited and allowed activities in these areas. Hither Creek, and potentially a very small

area of Polpis Harbor dredging will occur within the Cape and Islands Ocean Sanctuary. Allowed activities under the Ocean Sanctuary Act include dredging for navigational purposes.

2.2 Potential Sand Bank Locations

Consistent with past dredging efforts at Polpis Harbor, dredged material will be transported to and stored within sand banks on Nantucket Island. To facilitate this MEPA review, four potential sand bank locations have been identified to support the proposed project. The following section details the existing conditions at each site and followed in subsequent sections by relevant impact analysis. Given the stage of design and required Town coordination, the sand bank locations have not been finalized at this time.

It is anticipated that a combination of sand banks will be utilized for storage of dredged material and will be dependent upon proximity to either Polpis Harbor or Hither Creek. The location of the four potential sand banks is illustrated on **Figure 7**, described in detail below and followed with a characterization of existing conditions consistent with that provided for the dredging locations above.

2.2.1 Tom Nevers Field

Tom Nevers Field is a town-owned parcel of land on the south shore of Nantucket. The site is adjacent to Nantucket Housing Authority property. Two areas have been identified at Tom Nevers Field to the south and west of two baseball fields that have potential to temporarily store dredge sediments. The identified area is the largest of the potential sandbank locations, consisting of 4.89 acres of available space. The identified areas are currently unpaved managed grass fields which are routinely mowed and used for parking and recreational activities. Access to this sand bank location would occur off Tom Nevers Road and/or S Road. Routine daily traffic would not be interrupted by the hauling of dredged material to this location, but only during winter months when the field is not expected to be heavily utilized. It is expected that Tom Nevers Field would support storage of sediments dredged from Polpis Harbor.

2.2.1.1 Water and Wetland Resource Areas

Waters or wetland regulated resource areas do not occur within or proximate to Tom Nevers Field. It is noted that the coastal shoreline occurs to the south of the park, but which will not be impacted by the proposed sand bank location.

2.2.1.2 Massachusetts Threatened and Endangered Species

The proposed sand bank location does not include State of Massachusetts EH and PH as designated by the latest map revisions issued (August 1, 2021) by the Massachusetts NHESP.

2.2.1.3 ACEC

No ACECs are mapped at the site.

2.2.1.4 Commonwealth Tidelands

No commonwealth tidelands are mapped at this site, which the exception of the coastal shoreline that will not be impacted by the proposed sand bank location.

2.2.1.5 Cultural and Historic Resources

No cultural or historic resources are mapped at this site. Sand bank locations will be included with consultations addressed in Section 2.18 for dredge locations.

2.2.1.6 Environmental Justice Populations

No Environmental Justice populations are mapped at the Site. The site is greater than 1 mile from census 2020 environmental justice populations mapped to the west of this sand bank location.

2.2.2 10 Sun Island Road

The 10 Sun Island Road sand bank location is a town-owned storage yard operated by the Nantucket Airport Commission consisting of two adjacent storage yards totaling 1.77 acres. The area was developed in 2021 by the Airport Commission to store maintenance vehicles and other miscellaneous equipment. Access to this sand bank location would occur from Sun Island Road. Routine daily traffic would be only minimally interrupted by the hauling of dredged material to this location. It is expected that 10 Sun Island Road could support storage of sediments dredged from both Polpis Harbor and Hither Creek.

2.2.2.1 Water Resource Areas

Waters or wetland regulated resource areas do not occur within or proximate to this proposed sand bank location.

2.2.2.2 Massachusetts Threatened and Endangered Species

This proposed sand bank location does not include State of Massachusetts EH and PH as designated by the latest map revisions issued (August 1, 2021) by the Massachusetts NHESP.

2.2.2.3 ACEC

No ACECs are mapped at this site.

2.2.2.4 Commonwealth Tidelands

No Commonwealth Tidelands are mapped at this site.

2.2.2.5 Cultural and Historic Resources

No cultural and historic resources are mapped at the Site. In addition, this site is operated as a town-owned storage yard. Sand bank locations will be included with consultations addressed in Section 2.18 for dredge locations.

2.2.2.6 Environmental Justice Populations

The Site is mapped within a minority environmental justice population; however, the proposed dredging activities are not expected to result in any adverse or disproportionate impacts to this community. The site is also zoned as a commercial neighborhood, and all surrounding land uses are all commercial. Traffic is expected only in the winter months, outside of densely populated areas, and with the long-term benefit of island populations by promoting coastal resiliency. The proposed use as a sand bank will not increase the burden on the mapped environmental justice population.

2.2.3 188 Madaket Road

188 Madaket Road is a town-owned parcel of land on the west side of Nantucket. The Municipal Administration office for Nantucket Public Works is on the Site. The Site is adjacent to Waste Options Inc., a recycling center, and Take It or Leave It, a thrift store. The identified area consists of 0.72 acres of available space. The identified areas consist of sand and gravel base with established aggregate bays and are routinely used for material storage and handling. Trucking access to the site is available via existing haul roads, ensuring efficient transport of dredged material. The location is adjacent to mapped

wetlands, though, site operations are designed to avoid disturbance to these sensitive areas. Routine daily traffic patterns will not be disrupted by project activities. It is expected that 188 Madaket Road would support storage of sediments dredged from Hither Creek. This location was previously authorized in 2016 as a sand bank location to support dredging in Polpis Harbor.

2.2.3.1 Water Resource Areas

Waters or wetland regulated resource areas do not occur within or proximate to the proposed sand bank location.

2.2.3.2 Massachusetts Threatened and Endangered Species

The proposed sand bank location does not include State of Massachusetts EH and PH as designated by the latest map revisions issued (August 1, 2021) by the Massachusetts NHESP.

2.2.3.3 ACEC

No ACECs are mapped at this site.

2.2.3.4 Commonwealth Tidelands

No commonwealth tidelands are mapped at this site.

2.2.3.5 Cultural and Historic Resources

No cultural and historic resources are mapped at this site, though the area was previously disturbed. Sand bank locations will be included with consultations addressed in Section 2.18 for dredge locations.

2.2.3.6 Environmental Justice Populations

No environmental justice populations are mapped at this site. The site is greater than 1 mile from census 2020 environmental justice populations mapped to the west of this sand bank location.

2.2.4 81 South Shore Road

81 South Shore Road is a town-owned parcel of land on the south shore of Nantucket. The site is adjacent to the Surfside Wastewater Treatment Facility. The identified area consists of 1.63 acres of available space. The identified area consists of an existing aggregate storage site, with the potential to utilize decommissioned storage beds for additional material storage as needed. Trucking access is provided via established site entrances, and use of this area for dredged material storage will not interfere with daily site operations or access routes. This location was previously authorized in 2016 as a sand bank location to support dredging in Polpis Harbor.

2.2.4.1 Water Resource Areas

Waters or wetland regulated resource areas do not occur within the proposed sand bank location.

2.2.4.2 Massachusetts Threatened and Endangered Species

The proposed sand bank location does not include State of Massachusetts EH and PH as designated by the latest map revisions issued (August 1, 2021) by the Massachusetts NHESP.

2.2.4.3 ACEC

No ACECs are mapped at this site.

2.2.4.4 Commonwealth Tidelands

No commonwealth tidelands are mapped at this site.

2.2.4.5 *Cultural and Historic Resources*

No cultural and historic resources are mapped at this site.

2.2.4.6 *Environmental Justice Populations*

The Site is mapped within a minority environmental justice population; however, the proposed dredging activities are not expected to result in any adverse or disproportionate impacts to this community. Traffic is expected only in the winter months, outside of densely populated areas, and with the long-term benefit of island populations by promoting coastal resiliency. The proposed use as a sand bank will not increase the burden on the mapped environmental justice population.

3 Proposed Project Description

The proposed project includes initial improvement dredging followed by periodic maintenance dredging at both Hither Creek and Polpis Harbor within the island of Nantucket. Both sites are previously dredged channels, and which require maintenance dredging to support navigation. The proposed action at both sites include:

- Polpis Harbor conservatively includes improvement dredging of 15,747 cy of material to a depth of -9.35 ft NAVD88 that includes the +2 ft allowable overdredge over an area of 74,500 sf. Dredge volumes to a depth of -7.35 ft NAVD88 would be 4,4470 cy.
- Hither Creek conservatively includes improvement dredging of 51,089 cy of material to a depth of -9.35 ft NAVD88 that includes the +2 ft allowable overdredge over the 346,620 sf area. Dredge volumes to a depth of -7.35 ft NAVD88 would be 15,218 cy.

The purpose of the proposed dredging is to improve navigation for recreational and commercial boating, improve tidal flushing, and maintain access to public boat ramps, landings, mooring fields, boat marinas, and shellfish areas. In coordination with local stakeholders, the Town identified specific locations where dredging is needed to support these objectives.

3.1 Proposed Project Action

The project sites and the need for periodic dredging is included in the Town's municipal harbor plan entitled: Nantucket & Madaket Harbor Action Plan which was approved by the Massachusetts Executive Office of Energy & Environmental Affairs (EEA) on December 21, 2009³. All dredging will be performed consistent with previously authorized dredge limits, to a design depth of -7.35 ft NAVD88 and with 3H:1V sideslopes. The project does includes up to 2-foot allowable overdredge to -9.35 ft NAVD88 and the volumes associated with this overdredge are conservatively provided above. The proposed improvement dredging is anticipated to impact a total area of 74,500 sf (including 3H:1V sideslopes) at Polpis Harbor, and 346,620 sf in Hither Creek.

Dredging is once again a Town necessity at both locations as a matter of public safety and access. Navigation within both site locations is compromised by shoaling that has occurred over the past 10 to 20 years. Based upon post dredge backfill rate analysis (**Attachment J**), the Town is also seeking approval for future maintenance dredging for a period of 10 years, which would utilize either mechanical or hydraulic methods to address the frequent shoaling that occurs within proposed dredging area (and further discussed below). The project will also continue to utilize sand bank locations to allow for dredge sediments to be temporarily stockpiled at one of four locations identified in this report for future reuse along town-owned shoreline areas to promote island resiliency to coastal storms. It is noted that the Town at this time is not prepared to select potential beach nourishment projects based upon both funding and Town planning stages. However, to support the MEPA review process, potential sites are identified in **Section 1.4**.

³ It is noted that the project sites and need for periodic dredging is also consistent with the revised Nantucket & Madaket Harbor Action Plan that is expected to be approved both the State and Town in 2026.

3.2 Conservation Measures

The proposed dredging project will incorporate various conservation measures, consistent with past regulatory approvals and sediment management practices on Nantucket. Dredging activities at Polpis Harbor and Hither Creek have been designed to avoid and minimize impacts to sensitive environmental resources, including mapped eelgrass beds and rare wildlife habitats. In addition, the following time of year restrictions are acknowledged that were previously approved as part of 2016 permit approvals:

- Restrict activities between March 16 to October 3 to minimize adverse impacts to federal listed species
- Restrict activities between January 15 to May 31 to protect winter flounder

The Town anticipates continued coordination with USACE and NOAA with respect to formalizing time of year restrictions.

3.3 Construction

3.3.1 Sequencing

The detailed construction sequence for dredging is summarized below, but recognized that final sequencing will be determined by the selected Contractor:

- Site mobilization and establish traffic access and/or control
- Dredge sediments from Polpis Harbor and Hither Creek
- Transport sediments to sand bank locations
- Install erosion/sediment control around sediment as necessary
- Demobilize

Preliminary design drawings to support the project are included as **Attachment K**. As noted above, it is recognized that future sediment reuse projects will require separate regulatory reviews and approvals.

3.3.2 Site Mobilization and Control

Before dredging activities, the selected Contractor is required to mobilize temporary facilities (as needed) and enact measures to control the impact of the project on the environment and neighboring residents. Boat access points to support construction will be identified by the Contractor. Site access approvals, for locations not owned by the Town, and which have not been identified at this time, will be the responsibility of the Contractor. Previous work in Polpis Harbor utilized the Steamship Authority wharf.

It is recognized that traffic control measures may be necessary on public roads throughout the brief dredging period. Temporary controls will include the following measures:

- Use of signs to advise of construction occurring ahead
- Use of flagmen as needed
- Use of temporary barriers, such as cones, safety fences, and safety tape, as needed

A traffic Control Plan will be prepared by the Contractor as needed and will address traffic-control means and methods associated with moving sediment from the project site to sand bank locations. It is noted that time of year restrictions will limit dredging to the winter months, when traffic on the island is minimized.

3.3.3 Dredging

The proposed dredging will be performed based on the selected contractor's preferred means and methods. It is anticipated the dredging will be performed using one of the following methods:

- Mechanical dredging using a barge mounted excavator or bucket-crane.
- Hydraulic dredging using a suction-cutterhead to loosen and entrain sediments and pump direction into a barge or scow.

After removal, the material will then be allowed to settle on the barge or scow and the effluent water will be pumped back into the harbor. The dewatered sediment will then be transported to shore and loaded on to trucks for disposal at the appropriate sand bank.

All dredging will be performed within authorized dredge limits to a design depth of -7.35 ft NAVD88 and including and additional 2 feet of allowable overdredge. The side slopes will be dredged to a 3H:1V slope.

3.3.4 Sand Bank Transportation and Storage

Dredged sand will be transported to one of four identified sand bank locations as identified in **Section 2.11**. Two of the four locations were previously approved in 2016 as sand bank locations to support maintenance dredging in Polpis Harbor.

For the Hither Creek portion of the proposed project, it is assumed that dredged material will be loaded at Madaket Marine and transported by truck using established local routes. Trucks will proceed from Madaket Marine onto North Cambridge Street, then turn onto Madaket Road, and continue to the primary storage location at 188 Madaket Road. This route covers approximately 2.0 miles and takes about 6 minutes, utilizing Madaket Road as the main thoroughfare to avoid smaller residential streets and ensure efficient, safe transport of materials. If the storage capacity at 188 Madaket Road is exceeded, any additional dredged material will be transported to the secondary storage site at 81 South Shore Road or 10 Sun Island Road. Both storage sites are established aggregate storage areas with suitable access for trucking operations. All transportation will be conducted along major roads to minimize potential impacts to local traffic and neighborhoods. In addition, dredging will occur in the winter months when traffic on public roads is minimized.

For the Polpis Harbor portion of the dredging project, it is assumed that dredged material will be loaded either Streamship Authority wharf or at the site off Wauwinet Road. Sands will be transported by truck to the primary storage location Tom Nevens Field or at 10 Sun Island Road. From the dredging site, trucks will proceed along Wauwinet Road to Polpis Road, continue along Milestone Road, and then onto Tom Nevens Road, totaling about 10.8 miles and 19 minutes of travel. The haul route to 10 Sun Island Road will proceed from Wauwinet Road to Polpis Road, continue along Milestone Road, and then via Nobadeer Farm Road to Sun Island Road, covering a distance of approximately 6.8 miles in about 13 minutes. Both storage sites are established aggregate and material storage areas with suitable trucking access.

3.3.5 Maintenance Dredging Frequency

As discussed above, to refine future maintenance dredging needs, a post dredge backfill rate analysis was conducted (**Attachment J**). Both Polpis Harbor and Hither Creek experience variable seasonal sediment backfill rates and across different sections of their channels. Maintenance dredging frequency is governed by the section (or sections) of each channel expected to refill more quickly and pose a challenge to navigability. Continuous monitoring will confirm the necessity of maintenance dredging given

the variability of channel backfill rates and historic understanding of irregular channel infilling in both Polpis Harbor and Hither Creek.

3.3.5.1 *Polpis Harbor*

Results of the model demonstrate that the mid-section of the navigation channel experiences significant erosion, while deposition predominantly occurs at both ends of the proposed dredge channel. The model indicates the need for maintenance dredging within the 10-year timeline primarily focused on the mouth of the existing channel and at the northern bank of the inner inlet. Based on estimated post-dredge annual backfill rates, the model indicates that maintenance dredging will be required every four to five years at the mouth of the existing channel. Assuming a complete backfill rate of four to five years at the mouth of the channel, it is approximated that 3,044 cy to -7.35 ft NAVD88 or 6,667 cy to -9.35 ft NAVD88.

3.3.5.2 *Hither Creek*

Results of the model demonstrate that along the channel, sediment deposition occurs overall during both seasons, regardless of whether dredging operations are conducted. The model demonstrates a focus of shoaling in the entrance to the mid-reach of the channel. Based upon both the backfill rate analysis as well as direct observations of shoaling within the creek, maintenance dredging is proposed for every three years and up to three times within the 10-year maintenance period to maintain safe navigation into and out of the harbor. Based upon backfill rate analysis, it is assumed that each maintenance dredging action will remove 15,218 cy to -7.35 ft NAVD88 or 51,088 cy to -9.35 ft NAVDD that will be transported to the sand bank locations or an approved beach nourishment location.

4 Alternatives Analysis

Alternative analysis guidelines require the following determinations:

- The project is the least environmentally damaging practicable alternative;
- The project will not cause or contribute to the violation of applicable State or Federal laws, such as water quality standards or the Endangered Species Act;
- The project will not result in significant degradation of federal and/or state regulated waters and wetlands; and
- Any appropriate and practicable steps have been taken to minimize the adverse impacts of the project on wetlands and other waters.

An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics considering the overall project purposes. It is also recognized that the project must consider the public interest.

4.1 No Action

Under the “No Action” alternative, no dredging would occur within either Polpis Harbor or Hither Creek. If left unmaintained, public access and safe navigation would deteriorate further at both locations. The presence of shoals would develop within the current navigation channels, leading to a higher risk of vessel groundings, accidents, or spills into the harbor. Additionally, as water depths become increasingly shallow, vessels passing through would have a greater disturbance on sediments along the channel bottom and lead to an increase in turbidity and suspended sediments within the water column. As such, the “No Action” alternative is not considered a viable alternative.

4.2 Only 2025 Improvement Dredging

Under the “Only 2025 Improvement Dredging” alternative, dredging would occur once over a period of approximately ten years. Dredging would occur in all areas within the existing channel where the depth is less than -7.35 feet NAVD88 (**Attachment K**). In the short-term, this alternative would improve public access and navigation, promote tidal flushing within the waterway, and mitigate the risk of vessel groundings or spills within the harbor. However, in the long-term (i.e., after approximately three years from dredging) water depths would become increasingly shallow within the entrance channel, and the present issues of navigation, safety, and suspended sediments would arise. Backfill rate analysis (**Attachment J**) provides quantitative analysis that demonstrates the expected shallow conditions within the proposed project area that pose a challenge to navigation. As such, the “Only 2025 Improvement Dredging” alternative does not provide a viable long-term solution to the project objective.

4.3 2025 Improvement Dredging, followed by 10-Year Maintenance Dredging

Under the “2025 Improvement Dredging, followed by 10-Year Maintenance Dredging” alternative, dredging would occur at an annual frequency (i.e., every three years), as needed. Dredging would occur in all areas within the existing channel where the depth is less than -7.35 feet NAVD88 and an overdredge depth of + 2 feet. The continued maintenance dredging proposed under this alternative would improve public access and navigation, promote tidal flushing within the waterway, and reduce the risks of

vessel groundings and spills within the harbor. This alternative reflects the needs that have been continually demonstrated by natural processes at both locations in order to provide safe navigation within Polpis Harbor and Hither Creek. Backfill rate analysis (**Attachment J**) provides quantitative analysis that demonstrates the expected shallow conditions within the proposed project area that pose a challenge to navigation. As such, the “2025 Improvement Dredging, followed by 10-Year Maintenance Dredging” alternative is the preferred alternative and provides both a short- and long-term solution to the project objective.

4.4 Summary

Three alternatives were analyzed for the proposed dredging project. The “No Action” alternative is not a viable option as this would result in a reduction in tidal flushing, unsafe navigation conditions, an increase in turbidity and suspended sediments, and eventually a complete loss of navigable channel. The “Only 2025 Improvement Dredging” alternative is not a viable long-term solution, as the same conditions that would arise from the “No Action” alternative would arise shortly after the 2025 dredging occurs due to natural sedimentation processes. As such, the “2025 Improvement Dredging, followed by 10-Year Maintenance Dredging” alternative is the preferred alternative in that it improves public access and navigation, promotes tidal flushing, and reduces the risks of vessel grounding and spills for the entire 10-year maintenance period and beyond.

Constructability – The project could be constructed using standard construction techniques.

Cost – The Town has adequate funding to support initial improvement dredging followed by annual maintenance dredging in the proposed project areas.

Minimize Fill to Waters – The project would not place fill within federal and state regulated waters. All future beach nourishment projects would be approved under separate regulatory reviews and approvals.

Minimize Impacts to Threatened and Endangered Species – The project would have the least possible effect on protected species of conservation concern while still achieving the objective of maintained navigable channels, tidal flushing, and minimal turbidity.

Minimize Impacts to Water Quality – The project would prevent expected increases in turbidity and suspended sediments and would maintain tidal flushing.

Minimize Community Impacts – The project will have substantial benefits to Town residents by maintaining critical navigable channels for use with minimal impacts on environmental resources. In fact, the public has asked for the project to be completed. In addition, future beach nourishment projects will build on Town’s efforts to promote resiliency to coastal storms and flooding.

5 Regulatory Compliance

5.1 MA Environmental Policy Act

This Report is intended to support the completed MEPA ENF included as **Attachment A**. The proposed project was determined not to meet or exceed a mandatory Environmental Impact Report (EIR) threshold as defined at 301 CMR 11.03. Review thresholds identify categories of projects or aspects thereof of a nature, size or location that are likely, directly or indirectly, to cause damage to the environment. **Table 3** summarizes the evaluation of MEPA review thresholds. Through this evaluation, the project does include dredging of sediments over 10,000 CY and therefore triggers a MEPA review.

Table 3. MEPA Review Threshold Evaluation

Review Category	Required ENF and Mandatory EIR (Yes/No)	ENF and Other MEPA Review if the Secretary So Requires (Yes/No)	Comments
<i>Land</i>	No	No	<p>The project will generally not result in impervious surfaces, except for a potential lay down pad at the 10 Sun Island Road sand bank location. That impervious pad to support operations would be less than 2 acres and would not trigger ENF thresholds.</p> <p>Sand bank locations do not exceed 50 acres of land and will require minimal alteration based upon existing land uses or current conditions.</p>
<i>State Listed Species</i>	No	No	<p>The proposed project areas are located within mapped Priority and Estimated Habitat of rare wildlife. The project will file with the NHESP for review and approval.</p> <p>Project areas remain within previously authorized dredge channels, and dredging will adopt previously approved time-of-year restrictions. The project is not expected to result in a take of state listed species.</p>

Review Category	Required ENF and Mandatory EIR (Yes/No)	ENF and Other MEPA Review if the Secretary So Requires (Yes/No)	Comments
<i>Wetlands, Waterways and Tidelands</i>	No	Yes	<p>Project includes dredging of 10,000 or more CY of material within previously authorized navigation channels.</p> <p>The project will result in less than ten acres of alteration of “any other wetland” as defined by the Massachusetts Wetland Protection Act.</p> <p>The project will not alter eelgrass habitat; saltmarsh or outstanding resource waters; coastal dune, beach or bank habitat; bordering or isolated vegetated wetlands.</p>
<i>Water</i>	No	No	No water withdrawal or other water dependent use as defined by MEPA thresholds are required.
<i>Wastewater</i>	No	No	No aspects of the project are related to wastewater treatment.
<i>Transportation</i>	No	No	No aspects related to development of land transportation.
<i>Energy</i>	No	No	No aspects related to energy generation.
<i>Air</i>	No	No	No aspects related to air emissions as defined by MEPA thresholds.
<i>Solid and Hazardous Waste</i>	No	No	No new capacity or expansion in capacity for combustion or disposal of any soil waste, storage, treatment or processing.
<i>Historical and Archaeological Resources</i>	No	No	Based upon past dredging actions and approvals within existing navigation channels, it is assumed that historical and archeological resources will not be impacted by the project.
<i>Area of Critical Environmental Concern</i>	No	No	No ACECs are mapped at the Site.

Review Category	Required ENF and Mandatory EIR (Yes/No)	ENF and Other MEPA Review if the Secretary So Requires (Yes/No)	Comments
Regulations	No	No	Not applicable.

5.1.1 ENF Filing Requirements (301 CMR 11.05)

The following sections address the ENF preparation and filing requirements as specified at 301 CMR 11.05.

5.1.1.1 *Filing and Circulation Requirements*

The Town anticipates submitting this ENF to the Secretary of Energy & Environmental Affairs. This will initiate review of the project pursuant to MEPA.

Consistent with 301 CMR 11.15, the Town will publish a notice (see **Attachment L**) in a newspaper of local circulation in the Town no sooner than 30 days prior to and no later than the publication of the ENF in the Environmental Monitor. The Secretary of Energy & Environmental Affairs will publish relevant portions of the ENF in the Environmental Monitor at a pre-established date dependent on the submittal of this ENF package.

Subsequently with the filing of this ENF package with MEPA, the ENF will be circulated consistent with 301 CMR 11.16. A list of all agencies and persons to whom the Town anticipates sending the ENF is included in the MEPA Distribution List in **Attachment M**. In accordance with 301 CMR 11.16(2)(b), we are including the EEA EJ director and Department of Public Health (DPH) director on the MEPA distribution list, because there are EJ populations within 5 miles of the project area.

5.1.1.2 *Timely Filing*

The Town is filing the ENF in advance of the anticipated commencement of the project and recognizes the time required for a MEPA review that includes evaluation of alternatives analysis, consideration of cumulative environmental impacts, and time necessary to provide meaningful opportunities for public review.

5.1.1.3 *Consultation*

A consultation was requested for September 2025 in advance of submission of this permit. Regulatory input from that meeting has been included within this application.

5.1.1.4 *Environmental Justice Populations*

While the proposed dredging locations are outside a one-mile radius of mapped EJ populations on the island, it is recognized that two of the four sand bank locations do occur within mapped areas. One of these locations was in fact previously approved in 2016 as a sand bank location to support dredging at Polpis Harbor.

The project has already undertaken and committed to continuing to provide public involvement opportunities in the project. Specifically, a public open house was held in September 2024 to introduce the project and provide opportunities to include public input into the design process. This input is incorporated as part of the proposed design and addressing multiple public requests that were communicated during this public open house. Public opinion of this project is overwhelmingly positive.

It is also recognized that time of year restrictions will limit traffic impacts to winter months. As well, future resiliency projects that will utilize dredge sediments will promote sustainability of Town residents and inclusive of EJ populations.

5.1.1.5 Description of the Project and Potential Impacts

(a) A detailed description of the project and potential impacts are summarized in **Section 3**. A detailed alternatives analysis is summarized in **Section 4**.

MEPA review thresholds met by the project are summarized in **Table 3**. It is noted that the project does not meet any review thresholds for Required ENF and Mandatory EIR pursuant to 301 CMR 11.03.

An assessment of potential environmental impacts is included in **Section 3.4** and summarized in **Table 3**. The project is not anticipated to have negative impacts on any sensitive wildlife or wetland resources. Additionally, it is noted that the project is necessary in order to maintain safe navigational channels in the harbors of Nantucket. This project is being undertaken consistent with public support, and strives to support island wide resiliency projects intended to support sustainable communities across the island.

Given the above, no mitigation measures are proposed.

As described in the preceding section, no EJ populations or census tracts where >5% of residents identify as not speaking English very well occur within the project's designated geographic area.

The project is expected to support EJ populations by supporting long-term resiliency projects and has received public support as documented in a public open house.

(b) The proposed dredging areas are located entirely within flowed tidelands. The project is necessary to maintain navigation of both commercial and private traffic within Polpis Harbor and Hither Creek. See item (c) below for a Public Benefit Determination.

(c) 301 CMR 13.00 is applicable to all proposed projects in tidelands other than landlocked tidelands.

The submitted ENF and supporting attachments provide detailed information describing the nature of the tidelands to be affected and the long-term benefit to both tidelands as well as surrounding communities on the island. The public has already had the opportunity to provide input, and further comments are welcomed by the Town. To date, the community has been very supportive of the project as it promotes both navigation as well as future Town resiliency projects.

The project will require a Chapter 91 license, and which will be submitted following MEPA review.

5.1.1.6 The ENF

The ENF has been completed consistent with 301 CMR 11.00 (see **Attachment A**). This supplemental text is intended to support the MEPA ENF.

5.1.1.7 Required ENF Attachments

Referenced figures and attachments are included in the Table of Contents associated with this report.

In addition, a list of all agencies and persons to whom the Town circulated the ENF is included as **Attachment M** in accordance with 301 CMR 11.16(2).

5.1.1.8 Expanded ENF

To support the MEPA review, the following attachments are included to provide more detail related to the planning and permitting associated with this project:

- Resilient Mass Action Team Climate Resilience Design Standards Report (**Attachment N**)

Additional information on climate resilience and adaptation is provided in **Section 5.1.9**.

5.1.2 ENF Supporting Information

5.1.2.1 Land Resources

The proposed dredging will not impact land resources based upon design drawings (**Attachment K**). However, it is recognized that four sand bank locations will impact land resources. The total approximated acreage of the four identified sand bank locations include:

- Tom Nevers Field – 5 acres
- 10 Sun Road – 3 acres
- 188 Madaket Road – 1 acre
- 81 South Shore Road – 2 acres

The project will not result in impervious surfaces and will utilize existing staging areas or other previously altered areas. The project does not exceed MEPA thresholds and responds no to all questions specific to land resources.

While a land resources review is not required, it is noted that the use of sand bank locations and overall project goals is to promote island resiliency for coastal storms and flooding. The project aligns with Nantucket's Coastal Resilience Plan (2021) and has received public support to date. The project will maintain economic resiliency and not have significant impact on previously impacted upland areas to be utilized as future sand banks.

5.1.2.2 Rare Species

While the dredging projects occur in Estimated and Priority Habitats of Rare Wildlife, the project is not expected to result in a take of any listed species due to the following considerations:

- Conservation measures identified in Section 3.2.
- Dredging occurs within previously authorized dredging channels.

Following the filing of this ENF package, a streamlined MESA/WPA review will be initiated through the filing of the aforementioned NOI package, including additional MESA information, with the NHESP. The consultation will adopt previously approved conservation measures and is expected to mirror past MESA reviews. Consistent with a discussed of mapped state listed species at the sites, no species is expected to be present or impacted by the project through acceptable of conservation measures that limits dredging activities to winter months. As such, the project is expected to have “no effect” on state listed species and not result in a “take” of any listed species.

The project is also not expected to impact either eelgrass or shellfish populations. Eelgrass mapping (**Attachment H**) confirmed no populations within the dredge footprint. Shellfish populations are not expected to be impacted due to work only occurring in previously approved navigation channels.

5.1.2.3 Wetlands, Waterways, and Tidelands

The project will result in dredging of 1.71 acres in Polpis Harbor, and 7.95 acres in Hither Creek. All dredge areas are regulated as land under the ocean and will be permitted through filing of an NOI subsequent to this MEPA review. All areas are within mapped tidelands, and will also be approved through Chapter 91 licenses or permit to be applied for subsequent to this MEPA review.

5.1.2.3.1 Wetland Impacts and Permits

A NOI application will be filed with the state and Town subsequent to this ENF review. A full accounting of impacts to coastal wetlands is provided in the ENF form (**Attachment A**). The project will have temporary impacts associated with improvement and maintenance dredging over a ten year period. The project is intended to support navigation, but also have ecological improvements associated with maintaining tidal flushing at both sites.

The project will not construct or alter a dam, it will not place fill in any regulated wetland area, and will not occur in regulated buffer zones.

5.1.2.3.2 Waterways and Tideland Impacts and Permits

All areas are within mapped tidelands and will also be approved through Chapter 91 licenses or permit to be applied for subsequent to this MEPA review. The total volume and area of dredge is provided in the ENF form and detailed in this report.

It is noted that the project is near eelgrass beds, and extensive mapping was completed as part of this project to confirm the project would avoid eelgrass beds.

It is recognized that the project occurs in mapped shellfish beds, consistent with past MEPA reviews. The project minimizes impacts to shellfish by only occurring in previously approved navigation channels at both sites. Significant shellfish beds occur proximate to the project sites to compensate for any short term impacts associated with required dredging.

A comprehensive survey of sediment characteristics is provided in **Section 2.1.3**. The Town will continue work with MassDEP to evaluate the need for additional chemical sampling based upon these results. It is recognized that the majority of Polpis Harbor sediments demonstrates containing between 0.5 and 3 percent passing the No. 200 sieve and as such not requiring additional chemical sampling in accordance with 314 CMR 9.07(2)(a). It is assumed that sands dredged from Polpis Harbor will continue to be used for beach nourishment projects to promote resiliency to coastal storms and flooding. It is recognized that silty sands may not be appropriate for beach nourishment projects and will be considered for other ecological restoration projects (i.e., marsh creation, mosquito ditch restoration). The use towards other ecological restoration projects would be contingent upon findings of future chemical analysis.

Overall, the project is being undertaken with the approved Coastal Resilience Plan and which is intended to support coastal resiliency across the island.

5.1.2.4 Historical and Archaeological Resources

As described in **Section 2.9**, this project includes dredging navigational channels, and no historic or cultural resources are anticipated to be located in the dredging area. However, to request formal evaluation of any significant historic or archaeological resources within the proposed dredging areas, a Project Notification Form has been submitted to relevant parties, listed below:

- MHC – SHPO
- MHC Board of Underwater Archaeological Resources

- Wampanoag Tribe of Gay Head (Aquinnah) THPO
- Mashpee Wampanoag THPO

Consistent with **Section 2.9**, MHC found previously proposed Polpis Harbor dredging (in 2016) to have “no effect.” It is anticipated that a similar conclusion will support this project.

5.1.2.5 Climate Change Adaptation and Resiliency

The Resilient Mass Action Team Climate Resilience Design Standard Tool was utilized to enable the Town to assess climate change considerations when designing this project. The design report is included as **Attachment N**. The report recognizes that the benefit of this project is maintaining safe navigational channels for commercial and recreational boat passage.

It is recognized that the report is focused on land-based projects; as such, some of the project exposure factors are not necessarily applicable to work in water. The report does recognize the high exposure of the project due to the following:

- Sea level rise / Storm surge. This is due to the project occurring below the mean high water shoreline in an area with historic coastal flooding that is within the 1% flood hazard area. This exposure is not a concern, as the project is a proposed navigational channel that is located below the existing mean low water line.
- Extreme precipitation – Stormwater flooding. This is due to the project occurring within an area with historic flooding and a maximum annual daily rainfall of 6-10 inches within the project’s useful life. Again, this exposure is not a concern, as the project is a proposed navigational channel that is located below the existing mean low water line.

Given the project’s purpose as a navigational channel for boats, these exposures do not pose a significant concern for the project’s resilience in the face of climate change. Additionally, **Section 4** does not identify a suitable alternative for the project. Finally, the maintenance of these channels for a period of 10 years is anticipated to be covered by the aforementioned regulatory approvals.

5.1.2.6 Environmental Justice

EJ populations have been identified within 5 miles of the proposed dredging and include the following:

- Block Group 2, Tract 9504. Minority population is 45%, with a median household income of \$188,518. (This municipality has a median household income of \$112,306.) Approximately 1% of households with language isolation. 10 Sun Island Road proposed sand bank location occurs on the northern extent of this EJ mapped unit.
- Block Group 1, Tract 9504. Minority population is 29%, with a median household income of \$126,932. (This municipality has a median household income of \$112,306.) Approximately 0% of households with language isolation.
- Block Group 1, Tract 9502.01. Minority population is 43%, with a median household income of \$65,833. (This municipality has a median household income of \$112,306.) Approximately 2% of households with language isolation.
- Block Group 2, Tract 9502.02. Minority population is 38%, with a median household income of \$144,228. (This municipality has a median household income of \$112,306.) Approximately 0% of households with language isolation. 81 South Shore Road proposed sand bank location occurs in the southern extent of this EJ mapped unit.
- Block Group 1, Tract 9502.02. Minority population is 46%, with a median household income of \$62,315. (This municipality has a median household income of \$112,306.) Approximately 0% of households with language isolation.

- Block Group 2, Tract 9502.01. Minority population is 28%, with a median household income of \$157,574. (This municipality has a median household income of \$112,306.) Approximately 0% of households with language isolation.

Track 9504 in Nantucket is identified as Spanish or Spanish Creole representing 9.2% of the tract population. The Town is committed to continuing public involvement on this project, and including Spanish resources as required. However, it is noted that all EJ populations mapped on this island are less than 2% isolated by language.

The project is intended to support island wide coastal resiliency as documented in the formal plan, and which will be supportive of EJ populations. The project is not anticipated to generate 150 or more daily diesel vehicle trips. The project is scheduled for winter months and anticipates truck traffic far less than the required threshold. As such, it is determined that EJ populations, as well as residents across the island, will benefit from the proposed project. The Town is also committed to continuing public outreach as needed to educate residents as to the project and potential impacts and benefits associated with the project.

6 Conclusions

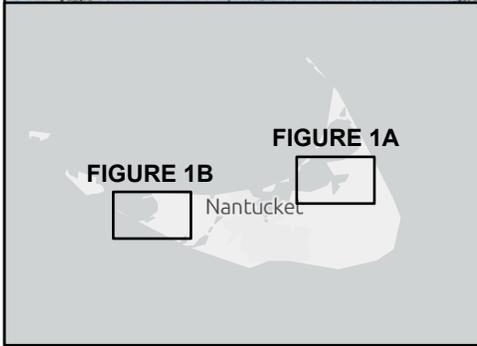
It is the Town's intent that this report, ENF form, and supporting figures and attachments are sufficient to support the required MEPA review for the proposed 10-year dredging project at both Polpis Harbor and Hither Creek. The objective of this report is to define the nature and elements of the proposed project and to demonstrate that the project's environmental impact will be avoided and minimized to the extent practicable. It is recognized that the project will require additional regulatory approvals as identified in this report.

Consistent with the Town's Coastal Resilience Plan, this project is proposed to promote coastal resiliency across the island for coastal storms and flooding. If any additional information is required to support this MEPA review, please do not hesitate to contact Town and/or Arcadis representative identified in the ENF form.

Attachment C

Figures

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LEGEND

PROJECT AREA

NOTES:

1. PROJECTION: NAD 1983 2011 STATEPLANE MASSACHUSETTS ISL FIPS 2002 FTUS
2. BASEMAP SOURCE: USGS, ACCESSED 1/6/2026
3. SCALE: 1:24,000

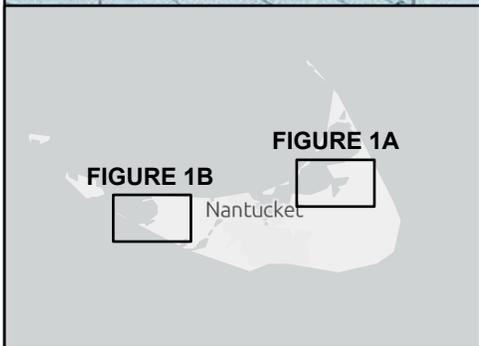
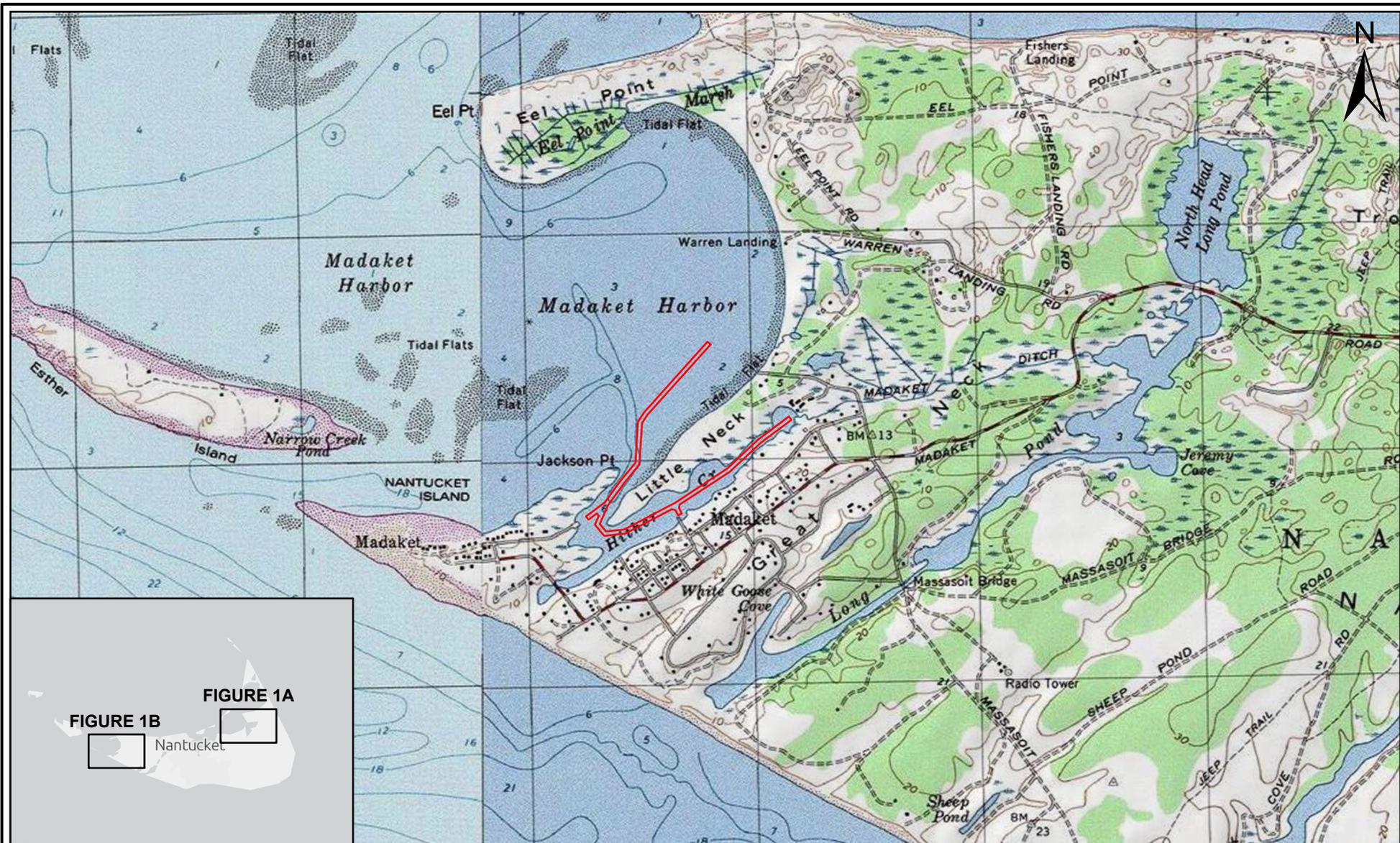
TOWN OF NANTUCKET | NANTUCKET, MA
 POLPIS HARBOR AND HITHER CREEK
 IMPROVEMENT DREDGING

**USGS SITE LOCATION MAP:
 POLPIS HARBOR**





FIGURE
1A

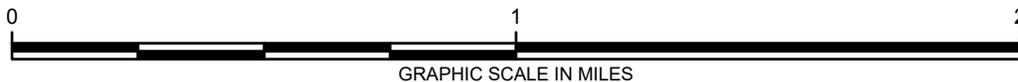


LEGEND

 PROJECT AREA

NOTES:

1. PROJECTION: NAD 1983 2011 STATEPLANE MASSACHUSETTS ISL FIPS 2002 FTUS
2. BASEMAP SOURCE: USGS, ACCESSED 8/27/2025
3. SCALE: 1:24,000

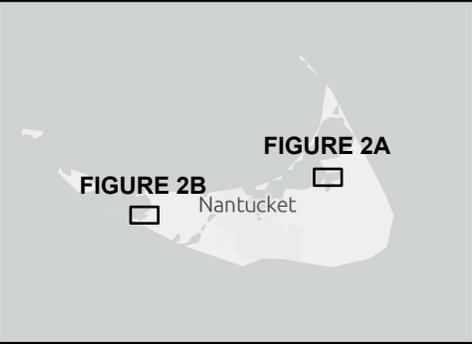


TOWN OF NANTUCKET | NANTUCKET, MA
 POLPIP HARBOR AND HITHER CREEK
 IMPROVEMENT DREDGING

**USGS SITE LOCATION MAP:
 HITHER CREEK**



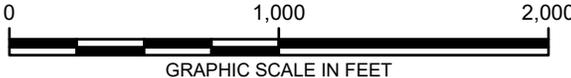
FIGURE
1B



LEGEND

 PROJECT AREA

- NOTES:**
1. PROJECTION: NAD 1983 2011 STATEPLANE MASSACHUSETTS ISL FIPS 2002 FTUS
 2. BASEMAP SOURCE: ESRI, ACCESSED 8/27/2025
 3. SCALE: 1:8,500

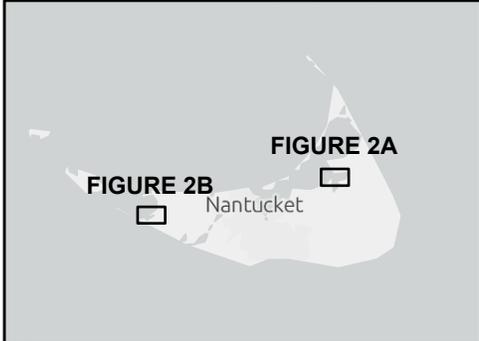
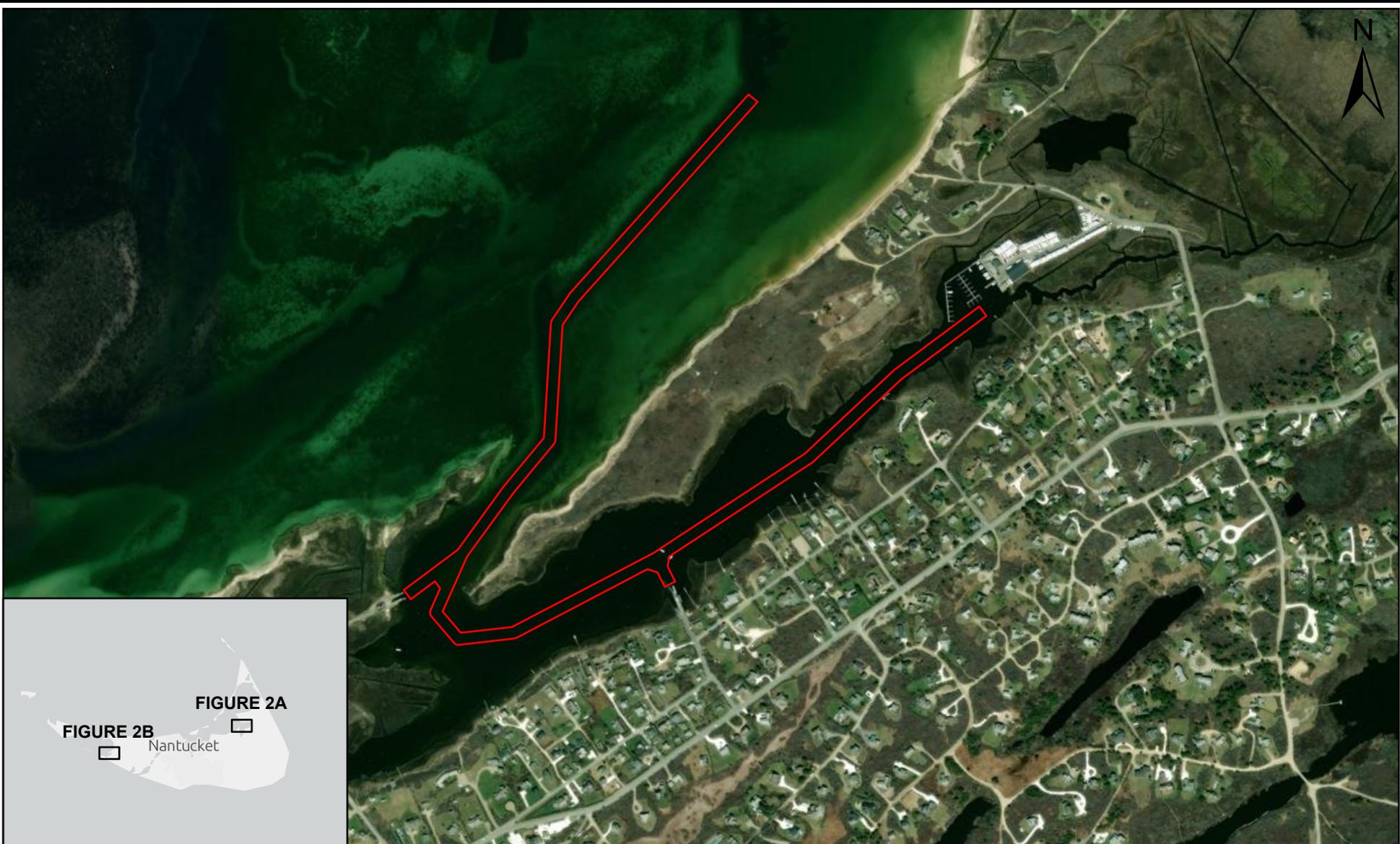


TOWN OF NANTUCKET | NANTUCKET, MA
POLPIS HARBOR AND HITHER CREEK
IMPROVEMENT DREDGING

**EXISTING CONDITIONS:
POLPIS HARBOR**



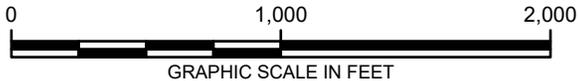
FIGURE
2A



LEGEND

 PROJECT AREA

- NOTES:**
1. PROJECTION: NAD 1983 2011 STATEPLANE MASSACHUSETTS ISL FIPS 2002 FTUS
 2. BASEMAP SOURCE: ESRI, ACCESSED 8/27/2025
 3. SCALE: 1:8,500

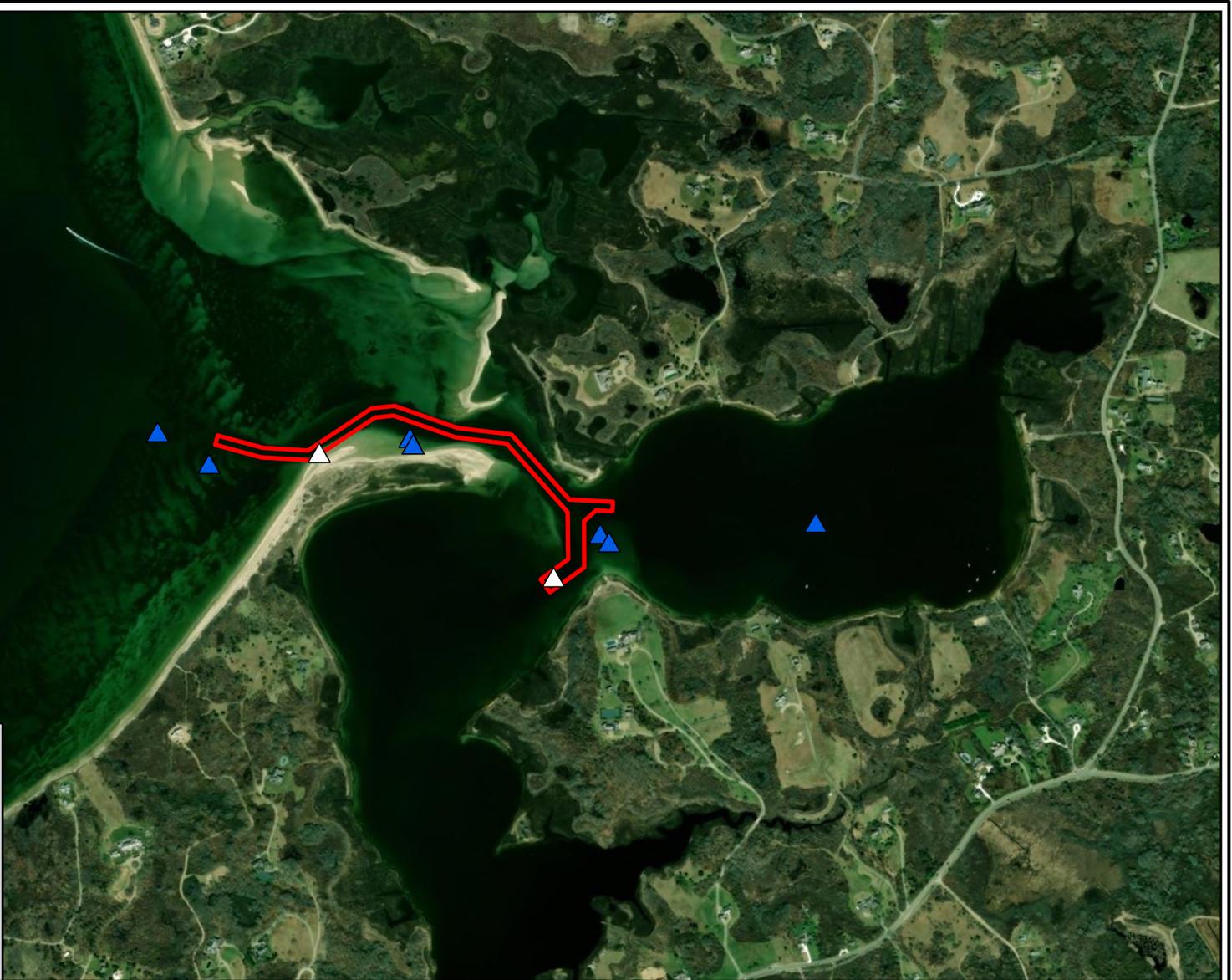
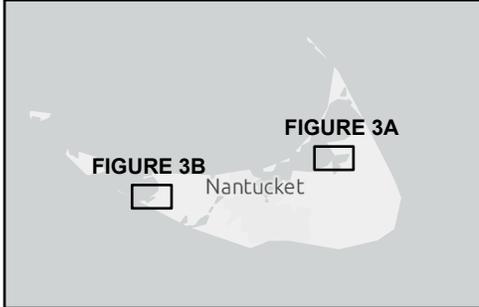


TOWN OF NANTUCKET | NANTUCKET, MA
POLPIS HARBOR AND HITHER CREEK
IMPROVEMENT DREDGING

**EXISTING CONDITIONS:
HITHER CREEK**



FIGURE
2B

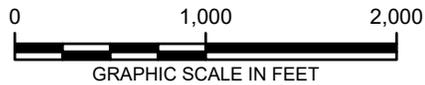


LEGEND

-  PROJECT AREA
-  2025 SEDIMENT SAMPLING LOCATIONS
-  2023 SEDIMENT SAMPLING LOCATIONS

NOTES:

1. PROJECTION: NAD 1983 2011 STATEPLANE MASSACHUSETTS ISL FIPS 2002 FTUS
2. BASEMAP SOURCE: ESRI, ACCESSED 12/15/2025
3. SCALE: 1:12,000



TOWN OF NANTUCKET | NANTUCKET, MA
POLPIS HARBOR AND HITHER CREEK
IMPROVEMENT DREDGING

**SEDIMENT SAMPLING LOCATION MAP:
POLPIS HARBOR**



FIGURE
3A

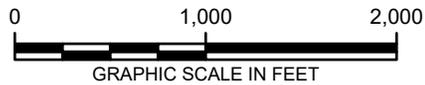


LEGEND

- PROJECT AREA
- 2025 SEDIMENT SAMPLING LOCATIONS
- 2023 SEDIMENT SAMPLING LOCATIONS

NOTES:

1. PROJECTION: NAD 1983 2011 STATEPLANE MASSACHUSETTS ISL FIPS 2002 FTUS
2. BASEMAP SOURCE: ESRI, ACCESSED 12/15/2025
3. SCALE: 1:12,000

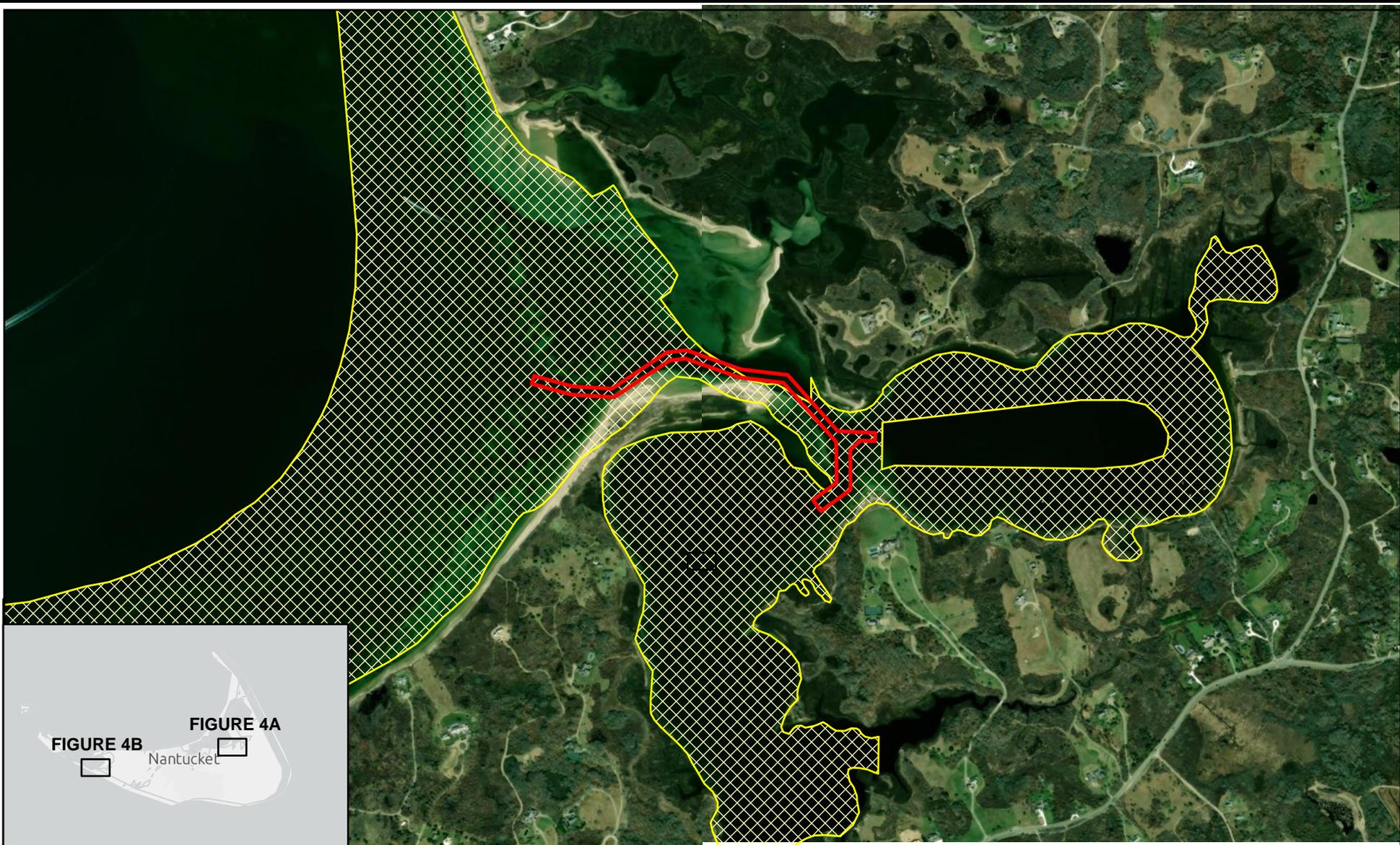


TOWN OF NANTUCKET | NANTUCKET, MA
 POLPIS HARBOR AND HITHER CREEK
 IMPROVEMENT DREDGING

**SEDIMENT SAMPLING LOCATION MAP:
 HITHER CREEK**



FIGURE
3B

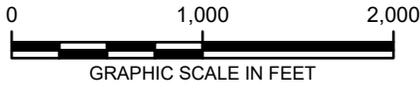


LEGEND

-  PROJECT AREA
-  SHELLFISH POPULATIONS
-  EELGRASS POPULATIONS

NOTES:

1. PROJECTION: NAD 1983 STATEPLANE MONTANA FIPS 2500 FEET
2. BASEMAP SOURCE: [BASEMAP SERVICE], ACCESSED 2/16/2026



TOWN OF NANTUCKET | NANTUCKET, MA
POLPIS HARBOR AND HITHER CREEK
IMPROVEMENT DREDGING

**SHELLFISH AND EELGRASS
POPULATIONS: POLPIS HARBOR**

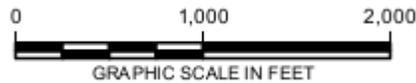


**FIGURE
4A**



- LEGEND**
-  SHELLFISH POPULATIONS
 -  EELGRASS POPULATIONS
 -  PROJECT AREA

- NOTES:**
1. PROJECTION: NAD 1983 STATEPLANE MONTANA FIPS 2500 FEET
 2. BASEMAP SOURCE: [BASEMAP SERVICE], ACCESSED 2/16/2026

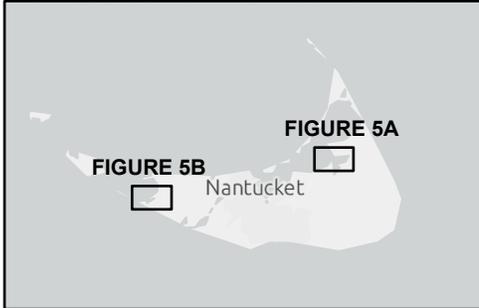


TOWN OF NANTUCKET | NANTUCKET, MA
POLPIS HARBOR AND HITHER CREEK
IMPROVEMENT DREDGING

**SHELLFISH AND EELGRASS
POPULATIONS: HITHER CREEK**

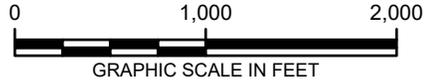


FIGURE
4B



- LEGEND**
-  PROJECT AREA
 -  NHEP PRIORITY HABITAT
 -  NHEP ESTIMATED HABITAT

- NOTES:**
1. PROJECTION: NAD 1983 2011 STATEPLANE MASSACHUSETTS ISL FIPS 2002 FTUS
 2. BASEMAP SOURCE: ESRI, ACCESSED 2/16/2026
 3. SCALE: 1:12,000



TOWN OF NANTUCKET | NANTUCKET, MA
POLPIS HARBOR AND HITHER CREEK
IMPROVEMENT DREDGING

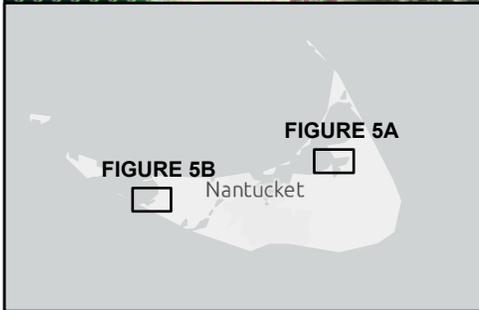
**NHEP HABITAT MAP:
POLPIS HARBOR**



FIGURE
5A



PH 888
EH 1365

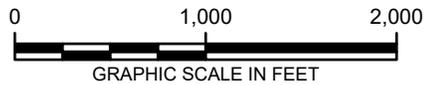


LEGEND

-  PROJECT AREA
-  NHESP PRIORITY HABITAT
-  NHESP ESTIMATED HABITAT

NOTES:

1. PROJECTION: NAD 1983 2011 STATEPLANE MASSACHUSETTS ISL FIPS 2002 FTUS
2. BASEMAP SOURCE: ESRI, ACCESSED 2/16/2026
3. SCALE: 1:12,000



TOWN OF NANTUCKET | NANTUCKET, MA
POLPIS HARBOR AND HITHER CREEK
IMPROVEMENT DREDGING

**NHESP HABITAT MAP:
HITHER CREEK**



FIGURE
5B

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LEGEND

- PROJECT AREA
- 1-MILE BUFFER
- 5-MILE BUFFER
- ENVIRONMENTAL JUSTICE CRITERIA**
- MINORITY

- NOTES:**
1. PROJECTION: NAD 1983 2011 STATEPLANE MASSACHUSETTS ISL FIPS 2002 FTUS
 2. BASEMAP SOURCE: ESRI, ACCESSED 8/27/2025
 3. SCALE: 1:152,620

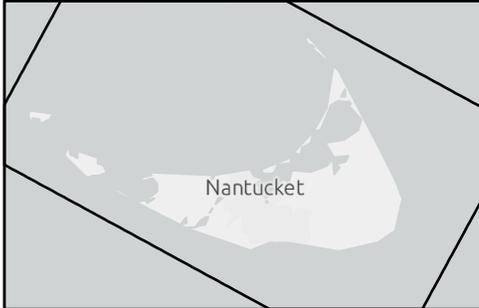
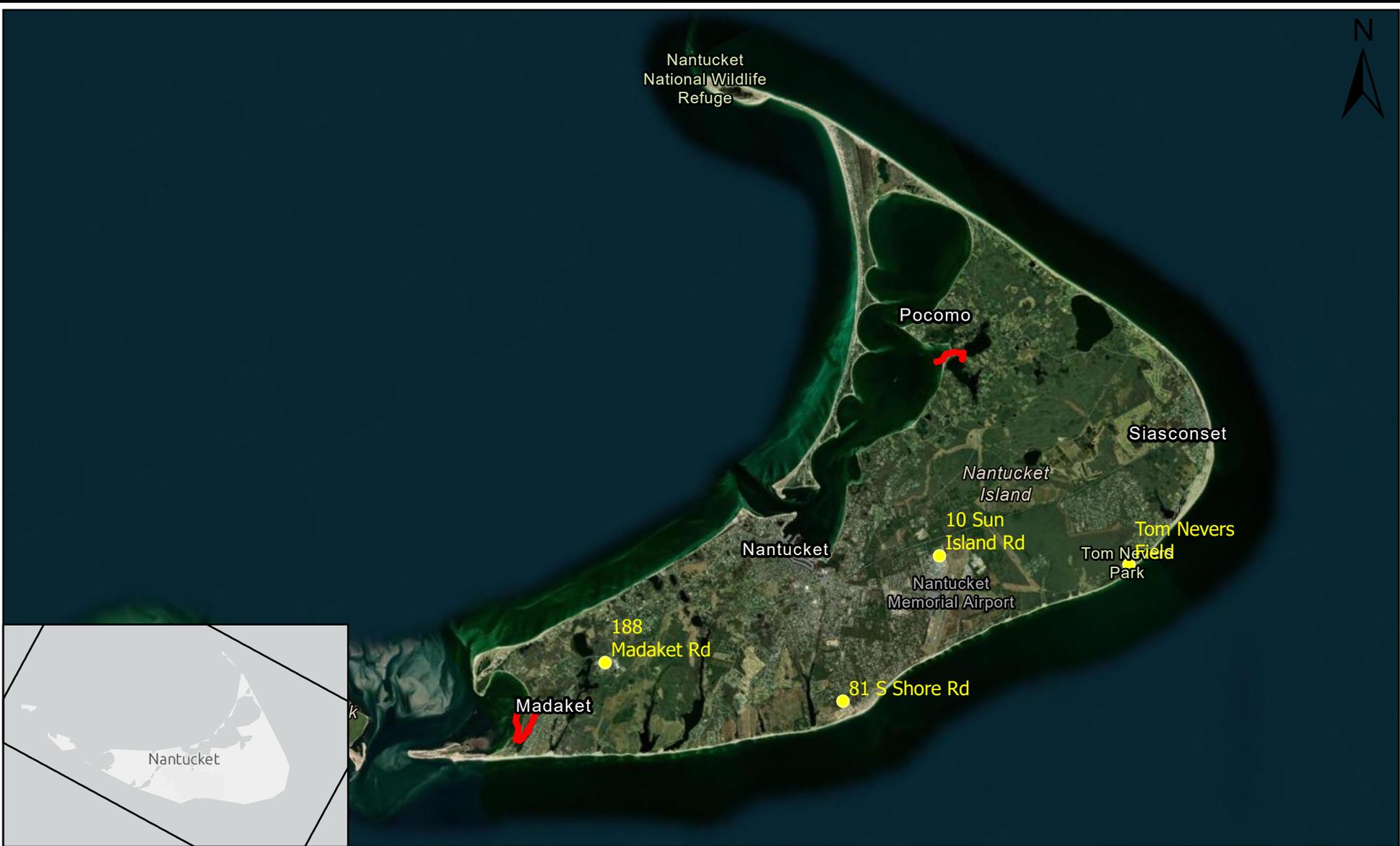


TOWN OF NANTUCKET | NANTUCKET, MA
POLPIS HARBOR AND HITHER CREEK
IMPROVEMENT DREDGING

**ENVIRONMENTAL JUSTICE
POPULATIONS**



FIGURE
6



LEGEND

-  LOD (HITHER HARBOR)
-  LOD (POLPIS HARBOR)
-  SAND BANK LOCATIONS

NOTES:

1. PROJECTION: NAD 1983 STATEPLANE MONTANA FIPS 2500 FEET
2. BASEMAP SOURCE: [BASEMAP SERVICE], ACCESSED 12/31/2025



TOWN OF NANTUCKET | NANTUCKET, MA
 POLPIS HARBOR AND HITHER CREEK
 IMPROVEMENT DREDGING

SAND BANK LOCATIONS



FIGURE
7

Attachment D

MassDEP 2016 Approvals



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

September 19, 2016

Regulatory Division
File Number: NAE-2014-01550

Town of Nantucket, Massachusetts
David Fronzuto
16 Broad Street
Nantucket, Massachusetts 02554

Dear Mr. Fronzuto:

We have reviewed your application to annually maintenance dredge up to 1.58 acres of the entrance channel to -6' MLW, plus 1' allowable overdredge, for up to 8,300 CY of sandy sediment. The sediment will be hydraulically or mechanically dredged, dewatered in barges at the dredge site, and transported to the Steamship Authority Wharf to be transferred into dump trucks. The sediment will then be stockpiled at the town-owned DPW yard and vacant lot off New South Road for future beach nourishment on area beaches. This project is located in Polpis Harbor at Nantucket Island, Massachusetts. The work is shown on the enclosed plans entitled "POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING PROJECT, NANTUCKET MASSACHUSETTS", on 11 sheets, and dated "APRIL 1, 2016".

Based on the information you have provided, we have determined that the proposed activity, which includes work and/or a discharge of dredged or fill material into waters of the United States, including wetlands, will have only minimal individual or cumulative environmental impacts. Therefore, this work is authorized under the enclosed February 2015 General Permits for Massachusetts (GPs for MA), specifically GP 5, under the pre-construction notification process. This work must be performed in accordance with the terms and conditions of the GPs and also in compliance with the following special condition(s):

1. The work authorized herein shall not be conducted during the time of year (TOY) restriction of March 16 to October 3, in order to minimize adverse impacts to federally listed endangered species.
2. You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date.
3. The National Marine Fisheries Service has provided the following Essential Fish Habitat conservation recommendation in accordance with the Magnuson-Stevens Fishery Conservation and Management Act.

Condition 3a: The work authorized herein shall not be conducted during the time of year (TOY) restriction of 15 January to 31 May, in order to minimize adverse impacts to winter flounder EFH.

Please contact Phillip Nimeskern of my staff at (978) 318-8660 if you have any questions.

Sincerely,



Barbara Newman
Chief, Permits & Enforcement Branch
Regulatory Division

Enclosures

cc:

Michael Count, CLE Engineering, 15 Creek Road, Marion, MA 02738
MCount@cleengineering.com

Ed Reiner, U.S. EPA, Region 1, Boston, Massachusetts, reiner.ed@epa.gov

Alison Verkade, NOAA; alison.verkade@noaa.gov

Robert Boeri, Coastal Zone Management, Boston, Massachusetts, Robert.Boeri@state.ma.us

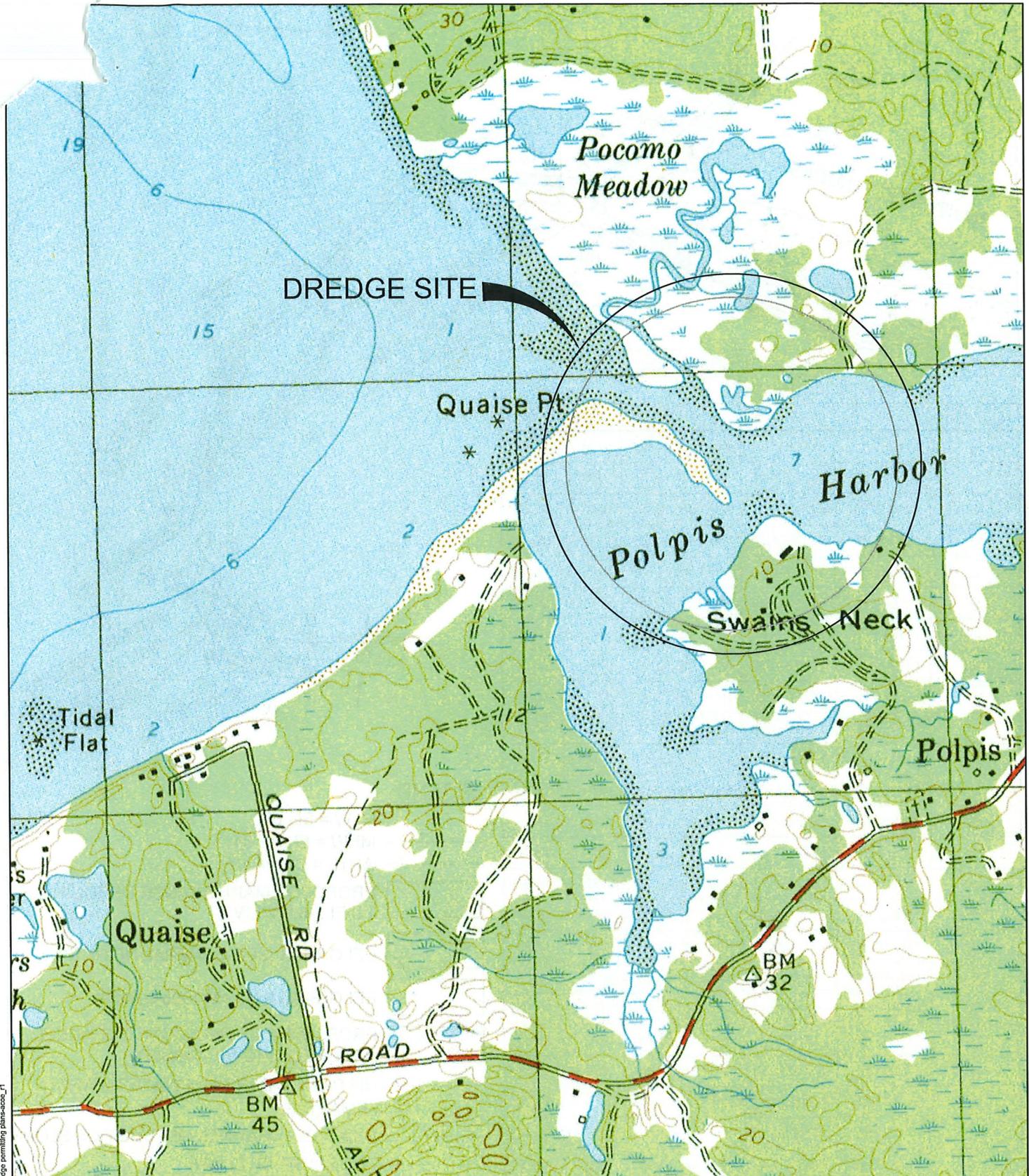
Jim Mahala, Acting Chief, DEP SERO, Wetlands and Waterways, Lakeville, Massachusetts;
jim.mahala@state.ma.us (DEP File No. X269790)

Ken Chin, MassDEP, ken.chin@state.ma.us

Michael Girvan, MassDEP-WRP, Boston, Massachusetts; michael.girvan@state.ma.us ,
(DEP File No. X269790)

Steve Pothier, Waterways Management Section, First Coast Guard District (dpw), Boston,
Massachusetts; steven.r.pothier@uscg.mil

Nantucket Conservation Commission, 2 Bathing Beach Road, Nantucket, MA, 02554.
jcarlson@nantucket-ma.gov ; jcuppone@nantucket-ma.gov



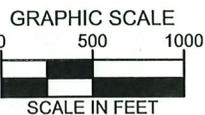
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PURPOSE: PROPOSED POLPIS HARBOR ENTRANCE
 CHANNEL MAINTENANCE DREDGING TO IMPROVE
 NAVIGATION AND TIDAL FLUSHING

DATUM:
 MLW = 0.0
 MHW = +3.04'
 AHTL = +4.10'

CLE ENGINEERING, INC.
 15 CREEK ROAD, MARION MA, 02738

LOCUS MAP

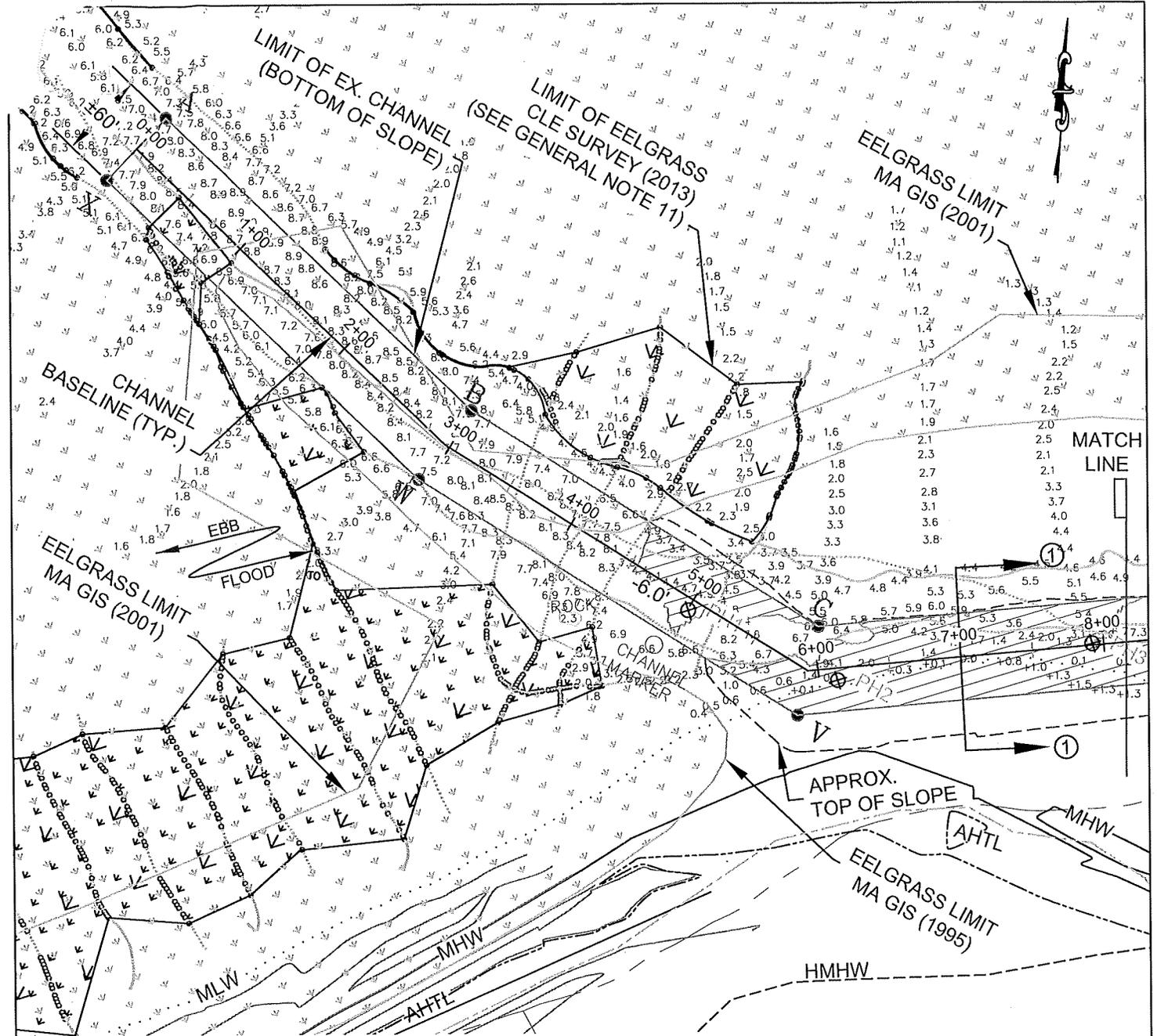


POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE
 DREDGING PROJECT
 NANTUCKET, MASSACHUSETTS

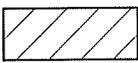
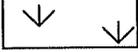
AT: POLPIS HARBOR/NANTUCKET HARBOR
 COUNTY OF: NANTUCKET
 APPLICATION BY: TOWN OF NANTUCKET

DATE: APRIL 1, 2016

SHEET 1 OF 11



LEGEND:

- MLW = EL. 0.0'
- MHW = EL. +3.04'
- AHFL = EL. +4.10'
-  PROPOSED MAINTENANCE DREDGING TO EL. -6.0' MLW
-  EELGRASS (SEE GENERAL NOTE 10)
-  EELGRASS VERIFIED BY U/W CAMERA (10/3/13)
-  EELGRASS SURVEY TRANSECT (10/3/13)

LEGEND (CONTINUED):

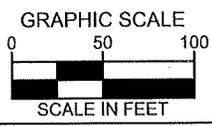
-  EELGRASS (MA GIS 1995 & 2001)
-  PROP. AREA OF RE-ALIGNED CHANNEL (NO DREDGING PROPOSED)
- HISTORIC MEAN HIGH WATER (HMHW)
- FEMA LINE
- EX./PROP. CHANNEL LIMIT/BOT.OF SLOPE
- PROP. TOP OF SLOPE

PURPOSE: PROPOSED POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING TO IMPROVE NAVIGATION AND TIDAL FLUSHING

DATUM:
MLW = 0.0
MHW = +3.04'
AHFL = +4.10'

CLE ENGINEERING, INC.
15 CREEK ROAD, MARION MA, 02738

SITE PLAN

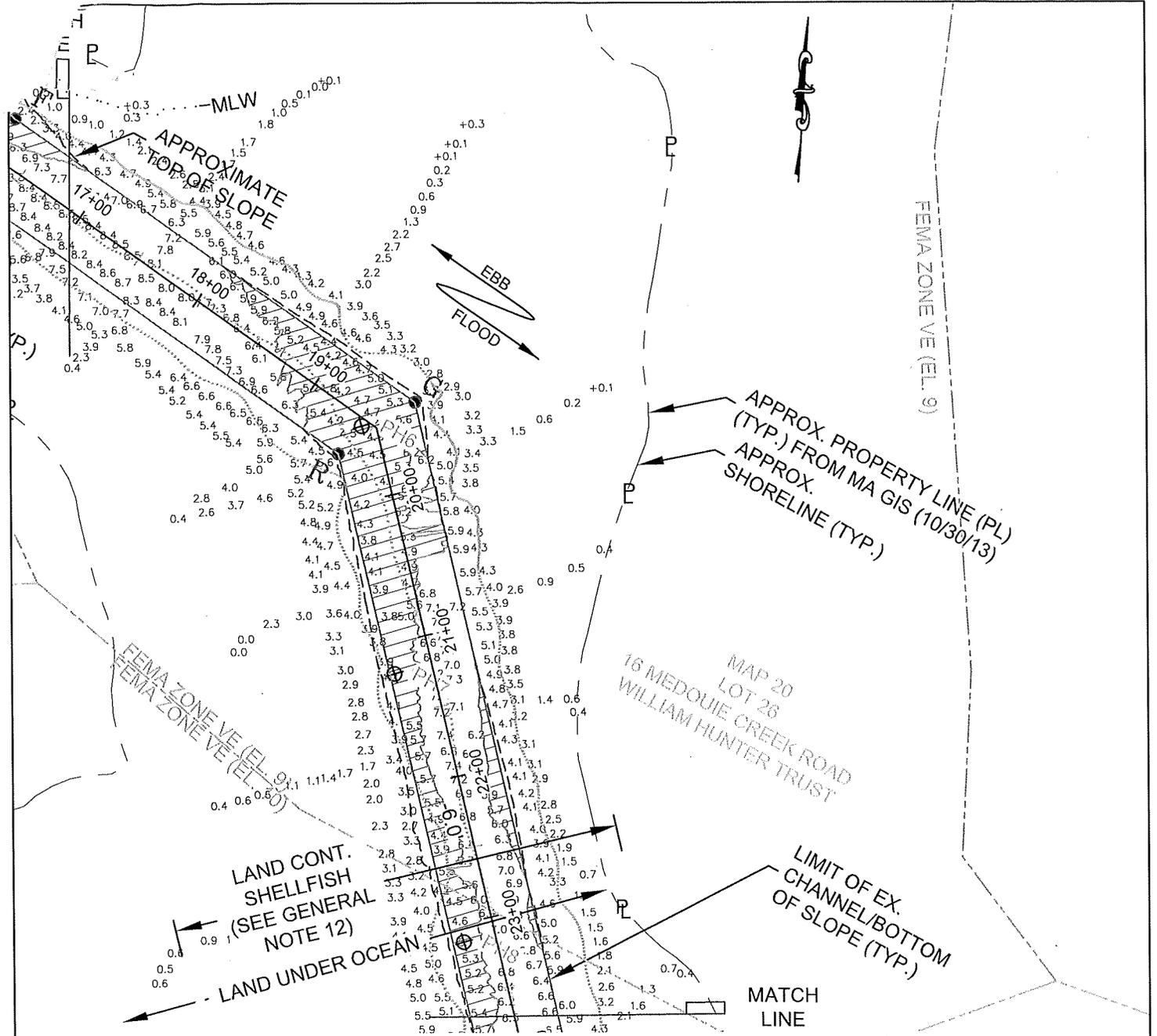


POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING PROJECT
NANTUCKET, MASSACHUSETTS
AT: POLPIS HARBOR/NANTUCKET HARBOR
COUNTY OF: NANTUCKET
APPLICATION BY: TOWN OF NANTUCKET

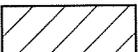
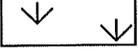
DATE: APRIL 1, 2016

SHEET 3 OF 11

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LEGEND:

- MLW = EL. 0.0'
- MHW = EL. +3.04'
- AHTL = EL. +4.10'
-  PROPOSED MAINTENANCE DREDGING TO EL. -6.0' MLW
-  EELGRASS (SEE GENERAL NOTE 10)
-  EELGRASS VERIFIED BY U/W CAMERA (10/3/13)
-  EELGRASS SURVEY TRANSECT (10/3/13)

LEGEND (CONTINUED):

-  EELGRASS (MA GIS 1995 & 2001)
-  PROP. AREA OF RE-ALIGNED CHANNEL (NO DREDGING PROPOSED)
- HISTORIC MEAN HIGH WATER (HMHW)
- FEMA LINE
- EX./PROP. CHANNEL LIMIT/BOT.OF SLOPE
- PROP. TOP OF SLOPE

PURPOSE: PROPOSED POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING TO IMPROVE NAVIGATION AND TIDAL FLUSHING

DATUM:
 MLW = 0.0
 MHW = +3.04'
 AHTL = +4.10'

CLE ENGINEERING, INC.
 15 CREEK ROAD, MARION MA, 02738

SITE PLAN

GRAPHIC SCALE

0 50 100



SCALE IN FEET

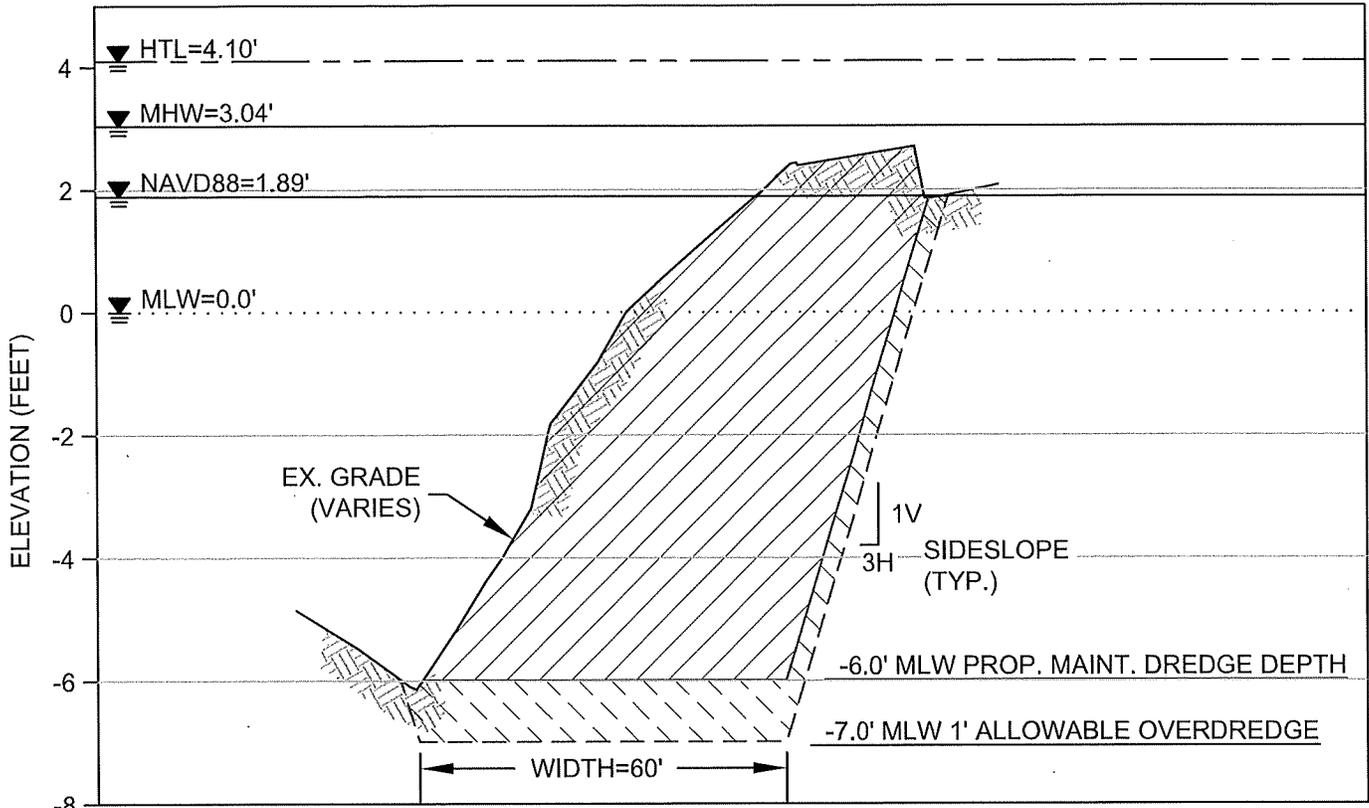
POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING PROJECT
 NANTUCKET, MASSACHUSETTS

AT: POLPIS HARBOR/NANTUCKET HARBOR
 COUNTY OF: NANTUCKET
 APPLICATION BY: TOWN OF NANTUCKET

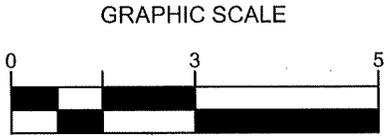
DATE: APRIL 1, 2016

SHEET 5 OF 11

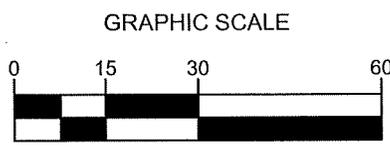
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STA. 7+00
TYPICAL DREDGE SECTION 1-1
 HORIZONTAL SCALE 1"=30'
 VERTICAL SCALE 1"=3'



(IN FEET)
 1 INCH = 3 FEET



(IN FEET)
 1 INCH = 30 FEET

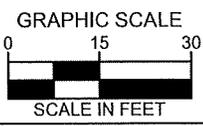
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PURPOSE: PROPOSED POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING TO IMPROVE NAVIGATION AND TIDAL FLUSHING

DATUM:
 MLW = 0.0
 MHW = +3.04'
 AHTL = +4.10'

CLE ENGINEERING, INC.
 15 CREEK ROAD, MARION MA, 02738

TYPICAL CROSS SECTION

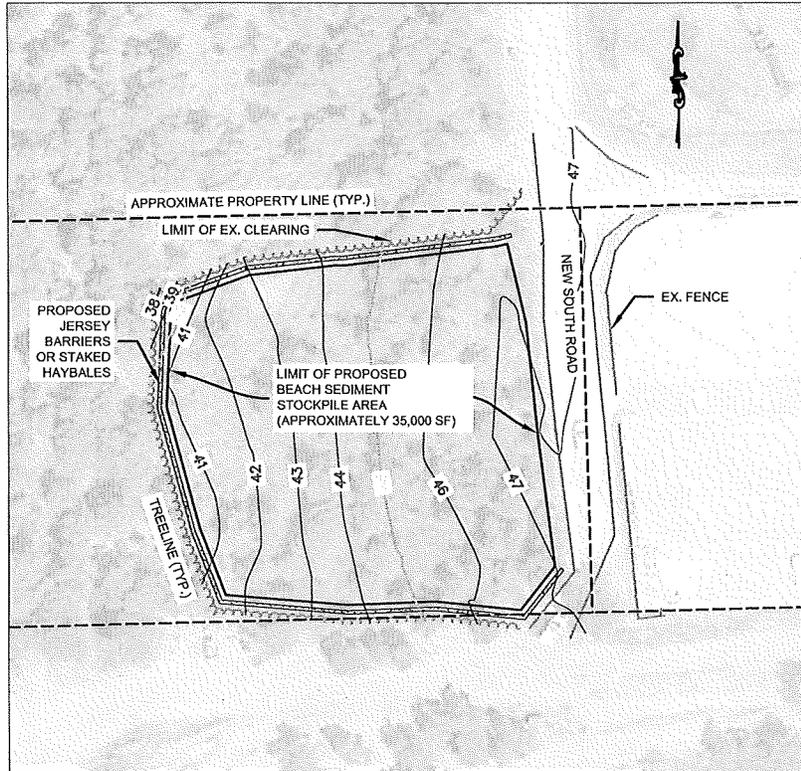


POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING PROJECT
 NANTUCKET, MASSACHUSETTS

AT: POLPIS HARBOR/NANTUCKET HARBOR
 COUNTY OF: NANTUCKET
 APPLICATION BY: TOWN OF NANTUCKET

DATE: APRIL 1, 2016

SHEET 7 OF 11



**STOCKPILE AREA
VACANT LOT (NEW SOUTH ROAD)**
SCALE: 1"=100'

STOCKPILE AREA NOTES:

1. VERTICAL DATUM: NAVD88
2. RESULTS OF TOPOGRAPHY FROM CLE ENGINEERING, INC. (CLE) SURVEY DATED 2/4/16.
3. LIMITS OF WETLAND VEGETATION AS SHOWN WERE FIELD VERIFIED ON 2/4/16. LIMITS OF DEP WETLANDS (SHRUB SWAMP) ARE BASED UPON AVAILABLE MA GIS INFORMATION.
4. PROJECT BENCHMARK IS DISK 8449130 H EL. 5.78' MLLW (3.69' NAVD88) LOCATED AT THE CHILDRENS BEACH BOAT RAMP IN NANTUCKET, MA.
5. COORDINATES ARE BASED ON NAD 83 STATE PLANE MASSACHUSETTS ISLAND.
6. PROPERTY LINES SHOWN ARE APPROXIMATE. INFORMATION OBTAINED FROM NANTUCKET GIS DATABASE.
7. DPW YARD STOCKPILE AREA IS LOCATED IN FEMA ZONE X AS SHOWN ON MAP 25019C066G DATED JUNE 9, 2014.
8. NEW SOUTH ROAD VACANT LOT STOCKPILE AREA IS LOCATED IN FEMA ZONE X AS SHOWN ON MAP 25019C0093G DATED JUNE 9, 2014.
9. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES SHOWN, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THAT TIME.
10. POSSESSION AND USE OF THE MATERIAL CONTAINED ON THESE DRAWINGS IS GRANTED ONLY IN CONNECTION WITH ITS USE AS IT RELATES TO THE TITLED PROJECT. ANY OTHER USE, REPRODUCTION OR DISCLOSURE OF THE INFORMATION CONTAINED HEREON IS EXPRESSLY PROHIBITED WITHOUT THE WRITTEN CONSENT OF CLE ENGINEERING INC.

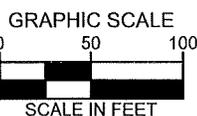
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PURPOSE: PROPOSED POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING TO IMPROVE NAVIGATION AND TIDAL FLUSHING

DATUM:
MLW = 0.0
MHW = +3.04'
AHTL = +4.10'

CLE ENGINEERING, INC.
15 CREEK ROAD, MARION MA, 02738

**DREDGE SEDIMENT
STOCKPILE PLAN &
NOTES**



POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING PROJECT
NANTUCKET, MASSACHUSETTS

AT: POLPIS HARBOR/NANTUCKET HARBOR
COUNTY OF: NANTUCKET
APPLICATION BY: TOWN OF NANTUCKET

DATE: APRIL 1, 2016

SHEET 9 OF 11

GENERAL NOTES:

1. VERTICAL DATUM: MEAN LOW WATER (MLW) = 0.0'; NAVD88= 1.89'; MEAN HIGH WATER (MHW) = 3.04'; ANNUAL HIGH TIDE LINE (AHTL) = 4.10'.
2. RESULTS OF HYDROGRAPHY FROM CLE ENGINEERING, INC. (CLE) SURVEY DATED 10/2/13, 10/3/13 & 10/22/13. SOUNDINGS ARE IN FEET AND TENTHS, AND REFER TO DEPTHS BELOW MLW. RESULTS OF TOPOGRAPHIC SURVEY FROM SURVEY DATED 10/22/13.
3. SEDIMENT SAMPLES COLLECTED BY TG+B MARINE SERVICES, INC. ON 5/8/14.
4. ALL DREDGE SEDIMENTS TO BE BENEFICIALLY RE-USED FOR PERMITTED COMPATIBLE BEACH NOURISHMENT SITES ACROSS THE ISLAND. DREDGE SEDIMENTS WILL BE DEWATERED, UNLOADED INTO DUMP TRUCKS AT THE STEAMSHIP AUTHORITY DOCK, AND TRANSFERRED TO A STOCKPILE AREA LOCATED AT THE TOWN OF NANTUCKET DEPARTMENT OF PUBLIC WORKS YARD AT 188 MADAKET ROAD, NANTUCKET, MA.
5. LIMITS OF FRESH WATER WETLANDS, AS SHOWN, HAVE NOT BEEN DELINEATED. LIMITS ARE APPROXIMATE AND BASED UPON AVAILABLE MAGIS INFORMATION AND OBSERVED FIELD CONDITIONS.
6. PROJECT BENCHMARK IS DISK 9130 K 1981 LOCATED AT THE BRANDT POINT USCG STATION IN NANTUCKET, MA. SITE BENCHMARK IS HUB SET ON BEACH AT ENTRANCE TO POLPIS HARBOR AT EL. +3.91' MLW.
7. COORDINATES ARE BASED ON NAD 83 STATE PLANE MASSACHUSETTS ISLAND.
8. CHANNEL LIMITS SCALED IN BY CLE BASED UPON EXISTING PROJECT PLAN TITLED "PROPOSED HARBOR MAINTENANCE DREDGING AND BEACH NOURISHMENT, POLPIS HARBOR NANTUCKET, MA" MA DEM CONTRACT NO 3253.
9. CHANNEL MARKERS AND EX. TIMBER CHANNEL WALL LOCATION LOCATED IN THE FIELD WITH DGPS DURING TIME OF HYDROGRAPHIC SURVEY.
10. LIMITS OF EELGRASS INTERPOLATED BASED UPON TRANSECT LINES SURVEYED BY CLE ON DATES 10/2/13, 10/3/13, 10/22/13 & 10/23/13.
11. LAND CONTAINING SHELLFISH AREAS, AS SHOWN, ARE BASED UPON THE MOST CURRENT AVAILABLE MA GIS DATA OF WHICH REPRESENTS "POTENTIALLY SUITABLE HABITAT," AS IDENTIFIED BY MA DIV. OF MARINE FISHERIES. NO SHELLFISH SURVEY HAS BEEN PERFORMED TO CONFIRM PRESENCE OF ACTUAL HABITAT.
12. LIMITS OF EXISTING REMNANT DEGRADED/OVERWAHSED SALT MARSH, AS SHOWN, ARE APPROXIMATE AND REFLECT BOTH FIELD SURVEY & VISUAL OBSERVATIONS MADE BY CLE ON 10/12/13 & 5/8/14 RESPECTIVELY.
13. PROPERTY LINE INFORMATION FROM MA GIS DATABASE.
14. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES SHOWN, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THAT TIME. INTERPOLATED INFORMATION FROM BETWEEN SOUNDING RUNS IS NOT GUARANTEED. SHOALS, OBSTRUCTIONS OR OTHER DIFFERING CONDITIONS MAY EXIST BETWEEN THESE RUNS. CONSULT WITH CLE ENGINEERING FOR MORE DETAILED INFORMATION.
15. POSSESSION AND USE OF THE MATERIAL CONTAINED ON THESE DRAWINGS IS GRANTED ONLY IN CONNECTION WITH ITS USE AS IT RELATES TO THE TITLED PROJECT. ANY OTHER USE, REPRODUCTION OR DISCLOSURE OF THE INFORMATION CONTAINED HEREON IS EXPRESSLY PROHIBITED WITHOUT THE WRITTEN CONSENT OF CLE ENGINEERING INC.

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DREDGE NOTES:

1. ALL PROPOSED MAINTENANCE DREDGING SHALL BE TO A DEPTH OF -6.0' MLW WITH A 1-FT ALLOWABLE OVERDREDGE TO A DEPTH OF -7.0' MLW.
2. PROPOSED LIMITS OF DREDGING ARE CONSISTENT WITHIN THOSE LAST AUTHORIZED UNDER THE FOLLOWING REGULATORY APPROVALS:
 - MEPA ENF/SECRETARY CERT. EEA NO. 8868, ISSUED 12/5/1991.
 - MA DEP CHAPTER 91 PERMIT #229, ISSUED 7/2/1992.
 - ORDER OF CONDITIONS MA DEP FILE #SE 48-699, ISSUED 2/21/1992.
 - MA DEP WQ CERT TRANS# 21929, ISSUED 5/29/1992; REV. 3/8/1993.
 - U.S. ARMY CORPS OF ENGINEERS PERMIT #1991-02370, ISSUED 6/1/1992.
3. TOTAL ESTIMATED DREDGE VOLUME = ±8,300 CY (INCLUDES 1' ALLOWABLE OVERDREDGE & 3H:1V SIDESLOPES).
TOTAL ESTIMATED DREDGE AREA = ±69,039 SF (INCLUDES 3H:1V SIDESLOPES).

SURVEY NOTES:

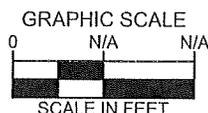
PROJECT NAME: POLPIS HARBOR
 PROJECT NUMBER: 12118
 PLOT SCALE: 1"=100'
 SURVEY DATE: 10/2/13, 10/3/13, 10/22/13
 SURVEYOR: M.COUNT, J. GUARD
 VESSEL: CLE LOWE
 TRANS./FATH.: 200KHZ, NARROW BEAM, ODOM MKII,
 WEATHER COND: MOSTLY SUNNY, WIND LIGHT WSW, SEAS CALM
 PROJECT DATUM: MLW
 COOR. SYSTEM: NAD-83, MASS ISLAND
 DATA REDUCTION: SOUNDING DATA SORTED W/HYPACK, 1' RADIUS
 TIDAL DATA: SCREW SET AT EL. +3.21' MLW ON TIMBER CHANNEL WALL TO SET TIDEBOARD
 BENCHMARK: PROJECT BENCHMARK IS DISK 9130 K 1981 AT USCG STATION BRANDT POINT,
 NANTUCKET EL. +4.84' MLW. SITE BENCHMARK IS HUB SET ON BEACH EL. +3.91' MLW

PURPOSE: PROPOSED POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING TO IMPROVE NAVIGATION AND TIDAL FLUSHING

DATUM:
 MLW = 0.0
 MHW = +3.04'
 AHTL = +4.10'

CLE ENGINEERING, INC.
 15 CREEK ROAD, MARION MA, 02738

NOTES



POLPIS HARBOR ENTRANCE CHANNEL MAINTENANCE DREDGING PROJECT
 NANTUCKET, MASSACHUSETTS

AT: POLPIS HARBOR/NANTUCKET HARBOR
 COUNTY OF: NANTUCKET
 APPLICATION BY: TOWN OF NANTUCKET

DATE: APRIL 1, 2016

SHEET 11 OF 11



**US Army Corps
of Engineers**®
New England District

**GENERAL PERMIT
WORK-START NOTIFICATION FORM**
(Minimum Notice: Two weeks before work begins)

* MAIL TO: U.S. Army Corps of Engineers, New England District *
* Permits and Enforcement Branch *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *

Corps of Engineers Permit No. NAE-2014-01550 was issued to Town of Nantucket, Massachusetts, on September 9, 2016. This work is located in Polpis Harbor at Nantucket, Massachusetts. The permit authorized the permittee to annually maintenance dredge up to 1.58 acres of the entrance channel to -6' MLW, plus 1' allowable overdredge, for up to 8,300 CY of sandy sediment.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Telephone Numbers: () _____ () _____

Proposed Work Dates: Start: _____ Finish: _____

Permittee/Agent Signature: _____ **Date:** _____

Printed Name: _____ **Title:** _____

Date Permit Issued: _____ **Date Permit Expires:** _____

FOR USE BY THE CORPS OF ENGINEERS

PM: Phillip Nimeskern **Submittals Required:** _____

Inspection Recommendation: _____



The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
 100 Cambridge Street, Suite 900
 Boston, MA 02114

Deval L. Patrick
 GOVERNOR

Maeve Vallely Bartlett
 SECRETARY

Tel: (617) 626-1000
 Fax: (617) 626-1181

<http://www.mass.gov/envir>

September 5, 2014

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
 ON THE
 ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME : Polpis Harbor Maintenance Dredging and
 Beach Nourishment Project
 PROJECT MUNICIPALITY : Nantucket
 PROJECT WATERSHED : Nantucket Harbor
 EEA NUMBER : 15241
 PROJECT PROPONENT : Town of Nantucket
 DATE NOTICED IN MONITOR : August 6, 2014

Pursuant to the Massachusetts Environmental Policy Act (MEPA, M.G.L. c.30, ss.61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **does not require** the preparation of an Environmental Impact Report (EIR).

Project Description

As described in the Environmental Notification Form (ENF), the project consists of maintenance dredging of the Polpis Harbor Entrance Channel by the Town of Nantucket (the Town) to address shoaling and restore and improve safe navigation, tidal flushing, and public access and use. The project will also include the beneficial reuse of dredged sediments to stabilize approximately 3,000 linear feet (lf) of eroded private shoreline. The Entrance Channel is comprised of two reaches which are approximately 60-feet wide by 3,500-feet long and approximately 100-feet wide by 900-feet long. The Entrance Channel was first dredged in 1940; the channel has since been maintained through dredging activities conducted in 1965 and 1993. All of the maintenance dredging and approximately 2,225 linear feet (lf) of the proposed beach nourishment is work that underwent prior MEPA review (EEA#8868) as part of the 1993 Polpis Harbor Dredging Project (1993 Dredging Project) and was issued a Chapter 91 (c.91) Permit on July 1, 1992 and a Section 401 Water Quality Certification (WQC) on May 29, 1992 (revised March 8, 1993) by the Massachusetts Department of Environmental Protection (MassDEP).

Both reaches of the Entrance Channel will be dredged to a depth of -6.0 feet mean low water (MLW), with a 1-foot allowable overdredge depth to -7.0 feet MLW and 3:1 (horizontal (H):vertical (V)) side slopes using hydraulic means. The project proposes to dredge approximately 69,039 square feet (sf) of the Entrance Channel, yielding approximately 8,300 cubic yards (cy) of sediment. This beach quality sand will be beneficially reused for the purposes of nourishing a section of private shoreline from 180 Polpis Road and along Quaise Road in a northeasterly direction towards Quaise Point. The nourishment area includes two areas that were previously authorized to receive approximately 32,500 cy of sediments as part of the 1993 Dredging Project:

- Disposal Site 1 consisted of a total of 1,520 lf of Quaise Point (including public beach); and
- Disposal Site 2 consisted of a total of 1,905 lf of privately-owned beach area extending from 180 Polpis Road to 208 Polpis Road.

The ENF describes the placement of sediments along an additional 775 lf portion of shoreline (new nourishment) located between Disposal Site 1 and Disposal Site 2. The ENF indicates that the placement of the dredged sediments along the private shoreline will help restore recreational and public access opportunities, as well as provide storm/flood protection for the mainland. Public access easements will be required from the 14 private property owners that will be receiving sediments. The Town is currently working to secure the required public access easements in accordance with the provisions of 310 CMR 9.40.4(a)(1), which allows for the placement of publicly dredged sediment on privately-owned land provided public access below mean high water (MHW) is secured by the Town from the land owner(s).

The total project area is approximately 6.58 acres. The total dredge footprint is estimated at 69,039 square feet (sf) (maintenance), while the beach nourishment is estimated at 3,000 lf (2,225 lf maintenance that includes 320 lf of Disposal Site 1 and all of Disposal Site 2 (1,905 lf) and 775 lf new beach nourishment). The project will result in the following wetland resource area impacts from dredging and beach nourishment activities:

- 56,908 sf of permanent impact to Land Under Ocean (LUO) (maintenance dredging);
- 232,781 sf of impact to Coastal Beach:
 - 12,131 sf of permanent impact (maintenance dredging);
 - 1,870 sf of temporary impact (dredge pipeline);
 - 152,331 sf of permanent impact (Disposal Sites 1 and 2);
 - 66,369 sf of permanent impact (new nourishment);
- 57,788 sf of permanent impact to Land Containing Shellfish (LCS)
 - 51,414 sf of permanent impact (maintenance dredging);
 - 3,203 sf of permanent impact (Disposal Sites 1 and 2)
 - 3,171 sf of permanent impact to LCS (new nourishment);
- 188 sf of temporary impact to Coastal Bank (equipment access);
- 974 sf of permanent impact to Salt Marsh:
 - 759 sf of permanent impact (Disposal Sites 1 and 2);
 - 215 sf of permanent impact (new nourishment); and

- 286,625 sf of permanent impact to Land Subject to Coastal Storm Flowage (LSCSF).

It is anticipated that the work will be performed during the fall 2014 – winter 2015 season. The Town is requesting that all regulatory approvals issued for the project include authorization for future maintenance dredging and nourishment activities for a period of ten years. The Town is also seeking approval for future maintenance dredging, which would utilize either hydraulic or mechanical methods, to address the frequent shoaling that occurs within the portion of the Entrance Channel located adjacent to Quaise Point. Dredging would occur routinely from land using a long reach excavator or crane.

Project Area

Polpis Harbor and the Quaise Point shoreline are located approximately three miles northeast of the entrance to Nantucket Harbor and approximately two miles south of the Head of the Harbor. The MHW and annual high tide (HTL) elevations are +3.04 feet and +4.10 feet, respectively, using MLW as a reference datum (MLW=0.0 feet). The project area is located within Zones VE Elevation (El) 9.0 feet, VE El. 10.0 feet, and VE El. 12.0 feet (NAVD88), as delineated by Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). The project area contains habitat for state-listed rare species.

Polpis Harbor is an active waterfront utilized by recreational and commercial vessels. Due to its geographic location, the harbor is used for storm refuge for boaters. The Town maintains many moorings within the harbor, which is also used by the Nantucket Community Sailing Program. Vessel access and navigational safety in and out of the harbor is compromised due to significant shoaling and sediment accumulation that has occurred within the Entrance Channel since it was last dredged in 1993. Existing water depths within the authorized channel in the vicinity of Quaise Point are above MLW, with the remaining channel typically varying in depth from two to eight feet below MLW.

The Quaise Point shoreline is located immediately southwest of the Entrance Channel and provides storm and flood damage protection to the adjoining upland areas, which include several private homes. Quaise Point, a Barrier Beach, in addition to another barrier beach, protects the mainland, adjacent marshes, and freshwater wetlands from coastal storm damage and flooding. The shoreline supports wildlife habitat for shorebirds and other coastal organisms. Erosion and degradation of natural resources, including Coastal Beach, Coastal Dune, and Coastal Bank, are impacting the shoreline system's ability to protect adjacent freshwater wetlands and upland areas.

Permits and Jurisdiction

The project is undergoing MEPA review and requires preparation of an ENF pursuant to 301 CMR Section 11.03(3)(b)(1)(a) and 11.03(3)(b)(1)(f) of the MEPA regulations because it will require a State Agency Action and will result in alteration of Coastal Bank, and alteration of one-half or more acres of other wetlands (Coastal Beach and LCS). The project will require a Section 401 WQC and a c.91 Permit from MassDEP. The project will require a filing in

accordance with the Massachusetts Endangered Species Act (MESA) to the Natural Heritage and Endangered Species Program (NHESP).

The project will also require an Order of Conditions from the Nantucket Conservation Commission (and on appeal only, a Superseding Order of Conditions from MassDEP), an Individual Permit from the United States Army Corps of Engineers (ACOE), review by the Massachusetts Historical Commission (MHC) acting as the State Historic Preservation Officer (SHPO) pursuant to Section 106 of the National Historic Preservation Act (NHPA), and federal consistency review by the Massachusetts Office of Coastal Zone Management (CZM).

Because the Town is not seeking State Financial Assistance, MEPA jurisdiction extends to those aspects of the project that are within the subject matter of required or potentially required state permits and that may cause Damage to the Environment, as defined in the MEPA regulations. In this case, MEPA jurisdiction extends to wetlands, waterways, and water quality.

Review of the ENF

The ENF provides a description of the project including previous MEPA review, a discussion of project alternatives, preliminary project plans, previously recorded plans and permit authorizations, sediment analysis, and identifies measures to avoid, minimize and mitigate project impacts. The ENF includes an analysis of three dredge area alternatives: No-Action, Maintenance Dredging, and Modified Maintenance Dredging (Preferred Alternative). Under the No-Action Alternative, no dredging would occur within the Entrance Channel which would result in impacts to public access and use, and safe navigation within the waterway. Shoaling would continue to increase thereby reducing tidal flushing and increasing the potential for vessel groundings, oil spills, releases of other hazardous materials, and continuous suspension of sediments into the harbor. Alternative 2 would involve maintenance dredging within the authorized dredging area and would restore and improve navigation, public access and use, and tidal flushing within the waterway; however, it would also result in a direct impact to approximately 32,030 sf of eelgrass habitat that is located within the southernmost reach of the 100-foot wide channel. The Preferred Alternative is similar to Alternative 2 with the exception that no dredging is proposed within the southernmost reach of the 100-foot wide channel due to the presence of eelgrass. Instead, channel access will be relocated slightly to the east where existing water depths are at a minimum -5.0 feet MLW or deeper. The Town will place channel markers that delineate a 50-foot wide access channel at this location of the harbor. The Preferred Alternative would avoid impacts to eelgrass and establish a safe, navigable public waterway, and restore and improve tidal flushing in Polpis Harbor.

The ENF also includes an analysis of three disposal alternatives: Disposal Site 1 (Quaise Point), Disposal Site 2 (Polpis/Quaise Road), and Northeasterly Expansion of Disposal Site 2 (Preferred Alternative). The use of Disposal Site 1, which was authorized and used as a nourishment site in 1993 was rejected due to the limited erosion observed and the site's proximity to the Entrance Channel. The Town prefers the selected nourishment location to be as far away from the channel as possible to minimize the need for future maintenance dredging. The use of Disposal Site 2, which was authorized but not used as a nourishment site in 1993, was rejected because the available area could not sufficiently accommodate the quantity of dredged

sediments. In order to accommodate the total dredging volume of 8,300 cy, and meet design constraints for placement of material above MLW, and maintaining 10H:1V side slopes and existing grades/elevations, the nourishment template design for the Preferred Alternative entails placing sediments along the entire authorized limit (1,905 lf) of Disposal Site 2 and approximately 320 lf of the southwesterly end of Disposal Site 1. In addition, sediments will also be placed along the 775 lf of shoreline that is located between the two authorized sites. The Preferred Alternative would place sediments as far from the Entrance Channel as possible, restore eroded beach areas and enhance coastal resiliency, restore shoreline protection of private properties, and keep sediments within the immediate littoral system.

Sediment Analysis and Disposal

The ENF indicates that the Town conducted sediment sampling to confirm the suitability of the dredged material for beach nourishment in accordance with MassDEP's 2007 *Guide to Best Management Practices (BMP) for Beach Nourishment Projects in Massachusetts*. Nine samples were collected on May 8, 2014 from the proposed dredge areas and 15 beach grab samples were collected on October 23 and 24, 2014 from the nourishment area. Based on a comparison of average grain size distribution of dredged and beach sediments, the dredged material meets MassDEP guidelines for reuse of dredged sediments as a nourishment source. Approximately 8,300 cy of dredged sediment from Polpis Harbor will be pumped up to a maximum distance of 1.25 miles to the shoreline above the high tide line via a hydraulic pipeline. Nourishment will be placed along a 3,000-lf section of the beach with a finished slope no steeper than 10:1 (H:V) to support rare bird species habitat. The toe of slope will not extend beyond MLW or directly impact nearshore areas that have been confirmed to contain eelgrass.

Wetlands and Waterways

Coastal wetland resources that will be impacted by the project include LUO, Coastal Beach, LCS, Coastal Bank, Salt Marsh, and LSCSF. The Nantucket Conservation Commission will review the project to determine its consistency with the Wetlands Protection Act (WPA), the Wetlands Regulations (310 CMR 10.00), and associated performance standards. MassDEP will also review the project for consistency with the 401 WQC regulations (314 CMR 9.00) and c.91 regulations (310 CMR 9.00).

Comments from MassDEP confirm that the project meets the definition of maintenance dredging in accordance with WPA and WQC regulations. MassDEP identified additional information that will be required during project permitting. The Town should:

- clarify whether the project is strictly a maintenance dredge project or a combination of both maintenance and improvement dredging;
- submit a copy of the Notice of Intent (NOI) to NHESP and the Division of Marine Fisheries (DMF) concurrent with submittal to the Nantucket Conservation Commission and MassDEP;
- demonstrate adherence to MassDEP guidelines for barrier beach management and BMPs for beach nourishment;
- depict the location of the dredge pipeline on project plans;

- include copies of all of prior authorizations permitting dredging and nourishment activities;
- provide post dredge and nourishment surveys demonstrating that impacts to eel grass have been avoided or minimized;
- consult with DMF to determine any time of year (TOY) restrictions; and
- provide public access easements in accordance with 310 CMR 9.40(4)(a)1.

The Town indicates it is working to secure the 14 required public access agreements. If the Town does not secure the agreements before the dredging work is slated to begin and determines that an alternate location for the dredged spoils will be used, the Town should file a Notice of Project Change (NPC) with the MEPA Office disclosing the new location for dredged materials.

According to DMF, both the proposed dredging and nourishment sites include mapped habitat for bay scallop (*Argopecten irradians*) and quahog (*Mercenaria mercenaria*) and are approved for shellfish harvest. Shellfish aquaculture grants are also located near the dredge site near the entrance to Polpis Harbor. Both sites have also been mapped as eelgrass (*Zostera marina*) meadows, one of the most productive habitat types for numerous marine species. Surveys performed in October 2013 by the Town confirmed the presence of historically mapped beds bordering the shoreline of the entire proposed nourishment area, and bordering the Entrance Channel to the west, north and south. Eelgrass has declined in Massachusetts by approximately 20 percent in the past decade, an estimated three acres of eelgrass lost per year. The project will be designed to avoid impacts to eelgrass. Specifically, no dredging will occur within the southernmost reach of the 100-foot wide channel where eelgrass is located. Channel access will be relocated slightly to the east where sufficient water depths already exist and channel markers will delineate a 50-foot wide access channel at this location of the harbor. MassDEP notes that permanent impacts to eelgrass may be required to be mitigated in consultation with DMF.

DMF has identified Polpis Harbor and bordering Nantucket Harbor as spawning habitat for winter flounder (*Pseudopleuronectes americanus*) and indicates that the Atlantic States Fisheries Commission has designated winter flounder spawning habitat as Habitat Areas of Particular Concern (HAPC). Winter flounder enter this embayment and spawn from January through May, laying clumps of eggs directly on the substrate. These demersal eggs hatch approximately fifteen to twenty days later. To protect habitat, fish passage, and reduce impact to spawning activities, DMF recommends: dredging activities remain at least 25 meters (approximately 75 feet) from all eelgrass beds; a TOY restriction on all dredging activity from January 15 to May 31; coordinating dredging activities with local aquaculture grant operators; and beach nourishment above MHW mark or the development of an eelgrass monitoring plan in coordination with DMF if intertidal deposition is permitted.

Sections of the proposed nourishment site contain salt marsh vegetation of which approximately 759 sf will be located within areas previously authorized under the 1993 Dredging Project and 215 sf will be located within new nourishment area. According to the ENF, these degraded marsh remnants are no longer considered to play a role in the protection of marine fisheries or wildlife habitat, prevention of pollution, groundwater supply or storm prevention and impacts resulting from the proposed nourishment activities are not considered to be significant to

these interests. I refer the Town to the comments from DMF that indicate that fringing marsh vegetation is still present in this area and should be considered significant as marine fisheries habitat. DMF opines that beach fill should not be deposited over existing vegetation as this would most likely result in the complete loss of remaining marsh vegetation in this area. I encourage the Town to consult with MassDEP and DMF to explore opportunities to modify the area of beach nourishment to avoid the alteration of salt marsh to the extent practicable.

I refer the Town to the comments from MassDEP with regards to dredging and beach nourishment activities. MassDEP indicates that outstanding issues can be addressed through the Wetlands Protection Act (WPA), 401 WQC and c.91 permitting processes. The Town should work with MassDEP to ensure that all appropriate materials and data requested is gathered in advance of filing the 401 WQC and c.91 applications. The Town should provide additional detail in the 401 WQC and c.91 applications as recommended by commenters to ensure consistency with applicable regulations.

The project is subject to CZM federal consistency review, and therefore must be found to be consistent with CZM's enforceable program policies. The Town should consult with CZM regarding the federal consistency review process.

Rare Species

The project site is located within Priority and Estimated Habitat as indicated in the Massachusetts Natural Heritage Atlas (13th Edition) and therefore requires a review through a direct filing with NHESP for compliance with MESA (321 CMR 10.00). The protected state-listed species include: piping plover (*Charadrius melodus*), and least tern (*Sternula antillarum*). The ENF indicates that the Town will include measures to protect state-listed species and their habitats, including adhering to any TOY restrictions imposed by NHESP and slope requirements (10H:1V) for the beach nourishment. Comments from NHESP indicate that it is anticipated that the proposed activities within these habitats can be adequately conditioned to avoid a prohibited "take".

Conclusion

The ENF has sufficiently defined the nature and general elements of the project for the purposes of MEPA review and demonstrated that the project's environmental impacts will be avoided, minimized and/or mitigated to the extent practicable. Based on review of the ENF and comments received, and in consultation with State Agencies, I have determined that no further MEPA review is required. Remaining issues can be addressed through the local, state and federal permitting and review processes.

September 5, 2014

Date


Maeve Vallely Bartlett

Comments Received:

- 08/14/2014 Massachusetts Board of Underwater Archaeological Resources (BUAR)
- 08/26/2014 Natural Heritage and Endangered Species Program (NHESP)
- 08/26/2014 Massachusetts Department of Environmental Protection (MassDEP) Southeast Regional Office (SERO)
- 08/27/2014 Massachusetts Division of Marine Fisheries (DMF)

MVB/PPP/ppp



PP

The COMMONWEALTH OF MASSACHUSETTS
BOARD OF UNDERWATER ARCHAEOLOGICAL RESOURCES
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
251 Causeway Street, Suite 800, Boston, MA 02114-2136
Tel. (617) 626-1200 Fax (617) 626-1240 Web Site: www.mass.gov/czm/buar/index.htm

August 13, 2014

RECEIVED

AUG 14 2014

MEPA

Secretary Maeve Valley Bartlett
Executive Office of Energy and Environmental Affairs
Attention: Purvi Patel, MEPA Unit
100 Cambridge St., Suite 900
Boston, MA 02114

RE: Polpis Harbor Maintenance Dredging and Beach Nourishment Project, Nantucket (EEA# 15241)

Dear Secretary Bartlett:

The staff of the Massachusetts Board of Underwater Archaeological Resources has reviewed the above referenced project's ENF (#15241) and supporting materials prepared by the CLE Engineering, Inc., on behalf of the Town of Nantucket. We offer the following comments.

The Board has conducted a preliminary review of its files and secondary literature sources to identify known and potential submerged cultural resources in the proposed project area. No record of any underwater archaeological resources was found within the project area. Based on the results of this review and the nature of the proposed activity (maintenance dredging and beach nourishment), the Board considers this project unlikely to adversely impact submerged cultural resources.

However, the area may be considered archaeological sensitive. Should heretofore unknown archaeological resources be encountered during the course of work, the Board expects that the project's sponsor will take steps to limit adverse affects (take care to not further disturb the archaeological resource and note its precise location) and notify the Board and the Massachusetts Historical Commission, as well as other appropriate agencies, immediately in accordance with the Board's *Policy Guidance for the Discovery of Unanticipated Archaeological Resources* (updated 9/28/06).

The Board appreciates the opportunity to provide these comments. Should you have any questions regarding this letter, please do not hesitate to contact me at the address above, by telephone at (617) 626-1141 or by email at victor.mastone@state.ma.us.

Sincerely,


Victor T. Mastone
Director

/vtm

Cc: Brona Simon, MHC
Bob Boeri and Steve McKenna, MCZM (via email transmission)
Bettina Washington, WTGH/A (via email transmission)
Ramona Peters, MWT (via email transmission)

Patel, Purvi (EEA)

From: Coman, Amy (FWE)
Sent: Tuesday, August 26, 2014 4:26 PM
To: Patel, Purvi (EEA)
Subject: RE: EEA#15241 Polpis Harbor Dredging and Beach Nourishment Project

Dear Purvi,

Project Name: Polpis Harbor Dredging and Beach Nourishment Project
Proponent: Town of Nantucket
Location: Polpis Harbor / Quaise & Polpis Roads
Project Description: Dredge & Nourishment
Document Reviewed: Environmental Notification Form
EEA File Number: 15241

The Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife has reviewed the Environmental Notification Form (ENF) for the *Polpis Harbor Maintenance Dredging and Beach Nourishment Project*. At this time, the NHESP would like to offer the following comments regarding state-listed rare species and their habitats.

The project site is located within Priority and Estimated Habitat as indicated in the 13th Edition of the MA Natural Heritage Atlas and therefore this project requires review through a direct filing with NHESP for compliance with the Massachusetts Endangered Species Act (MESA 321 CMR 10.00). According to the ENF, the applicant has proposed some measures to protect state-listed species and their habitats, including adhering to any time-of-year restriction imposed by NHESP and slope requirements (10H:1V) for the beach nourishment. Based on a preliminary review of the information provided in the ENF and the information contained in the NHESP database, it is anticipated that the proposed activities within these habitats can be adequately conditioned to avoid a prohibited "take".

We appreciate the opportunity to comment on this project. Please contact Amy (Coman) Hoenig with any questions about this letter at (508) 389-6364.

Sincerely,

Amy (Coman) Hoenig

Endangered Species Review Biologist | Natural Heritage & Endangered Species Program | MA Division of Fisheries & Wildlife
| ADDRESS - 100 Hartwell Street, Suite 230 West Boylston, MA 01583 | tel: 508.389.6364 | fax: 508.389.7890
| www.mass.gov/nhesp

From: Patel, Purvi (EEA)
Sent: Tuesday, August 26, 2014 3:33 PM
To: Coman, Amy (FWE); Schluter, Eve (FWE); Marold, Misty-Anne (FWE)
Subject: EEA#15241 Polpis Harbor Dredging and Beach Nourishment Project

Hello ladies,

Could you please let me know if I should be expecting comments from NHESP for this project? Comments are due today. I know the Town has not yet filed an application.

Thank you,
Purvi

Purvi P. Patel, EIT

**Massachusetts Environmental Policy Act (MEPA) Office
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114**

617-626-1029

MEMORANDUM

TO: Purvi Patel, Environmental Reviewer, MEPA Unit

THROUGH: Jonathan Hobill, Regional Engineer, Bureau of Resource Protection
Philip Weinberg, Regional Director
David Johnston, Deputy Regional Director, BRP
Maria Pinaud, Deputy Regional Director, BWP
Millie Garcia-Serrano, Deputy Regional Director, BWSC
Brenda Chabot, Deputy Regional Director, ADMIN

CC: Elizabeth Kouloheras, Chief, Wetlands and Waterways
Christine Odiaga, Wetlands Program
Carlos Fragata, Waterways Program
Pamela Truesdale, Municipal Facilities
Tena Davies, Wetlands Program
Leonard Pinaud, Chief, Site Management
Allen Hemberger, Site Management

FROM: Sharon Stone, SERO MEPA Coordinator

DATE: August 26, 2014

RE: ENF EOEEA #15241 – NANTUCKET – Polpis Harbor Maintenance
Dredging and Beach
Nourishment Project, Polpis
Harbor; Quaise and Polpis
Roads

"For Use in Intra-Agency Policy Deliberations"

The Southeast Regional Office of the Department of Environmental Protection (MassDEP) has reviewed the Environmental Notification Form (ENF) for the proposed maintenance dredging and beach nourishment project to be located at Polpis Harbor; Quaise and Polpis Roads, Nantucket, Massachusetts (EOEEA #15241). The project proponent provides the following information for the project:

The existing Polpis Harbor Entrance Channel is comprised of two reaches which are 60-feet wide by approximately ±3,500 feet long and ±100-feet wide by approximately ±900 feet long. Based upon available record information, both reaches have been previously dredged to a depth of -6.0 feet MLW, with a 1-foot allowable overdredge depth to -7.0 feet ML and 3H:1V sideslopes. According to the Town's municipal harbor plan entitled: "Nantucket & Madaket Harbor Action Plan", the Entrance Channel was originally created in 1940 and has been routinely maintained on ±25-30 year basis. Maintenance dredging efforts were performed in 1965 and most recently in 1993, under MA DPW, Division of Waterways Contract No. 2468 and MA DEM Contract No. 3253, respectively. The proposed maintenance dredging consists of approximately ±69,039 square feet (SF) (±1.58 acres) of the existing Polpis Harbor Entrance Channel, resulting in the removal of an estimated ±8,300 cubic yards (CY) of beach quality sand that will be beneficially used for nourishment. The existing Entrance Channel will be restored to depth of -6.0 feet MLW, with a one (1) foot allowable overdredge to -7.0 feet MLW and approximate 3H:1V sideslopes. The proposed dredge plan is provided in Exhibit D. Maintenance dredging is necessary to restore/improve safe navigation, tidal flushing and public access/use of the waterway.

Permits listed in the ENF to be sought for the project include the following:

Nantucket Conservation Commission - Notice of Intent/Order of Conditions
MassDEP 401 Water Quality Certification
MassDEP Chapter 91 Waterways Permit

Wetlands and Waterways Program Comments

The Wetlands and Waterways Program offers the following comments on the subject ENF:

- An individual 401 Water Quality Certification is required for proposed dredging, discharge of dredged material and dredged material disposal activities in waters of the United States within the Commonwealth; an application must be submitted to the MassDEP Boston office.
- The proposed activities require a Wetlands Protection Act Order of Conditions; a Notice of Intent (NOI) must be submitted to Nantucket Conservation Commission for all temporary and permanent alterations to Land Under Ocean, Coastal Beach (including inter-tidal zone), Coastal Dune, Coastal Bank, Salt Marsh, Bordering Vegetated Wetland and Land Subject to Coastal Storm Flowage, and Buffer Zones where applicable.
- The preferred alternative consists of dredging ~8,300c.y. (~69,039 s.f.) within the previously-permitted 100-foot wide entrance channel, and relocation of the channel at the southern end to an area where sufficient water depths already exist in order to avoid eelgrass beds. Said relocation will be accomplished by reconfiguring channel markers to delineate a 50-foot wide channel, with no apparent dredging beyond what has been previously approved; therefore, the preferred alternative meets the definition of “maintenance dredging” at 310 CMR 10.23 and 314 CMR 9.02. During permitting it should be clarified whether the project is strictly a maintenance dredge project or a combination of both maintenance and improvement dredging.
- This project proposes activities within Estimated Habitat of Rare Wildlife, per 310 CMR 10.37, therefore a copy of the NOI must be submitted to the Natural Heritage & Endangered Species Program concurrent with submittal to the Nantucket Conservation Commission and MassDEP.
- Portions of the proposed work are proposed below the Mean High Water line therefore a copy of the NOI must be sent to the Mass. Division of Marine Fisheries (MDMF) concurrent with submittal to the Nantucket Conservation Commission and MassDEP.
- Some beneficial reuse of dredged material is proposed on barrier beaches; these activities should adhere to the Guidelines for Barrier Beach Management in Massachusetts.

- The proponent is advised to review the MassDEP's Beach Nourishment Guide to Best Management Practices in Massachusetts (<http://www.mass.gov/eea/docs/dep/water/resources/a-thru-m/bchbod.pdf>).
- The ENF refers to a dredge pipeline, but the location of this pipeline is not shown on the project plans and will be required to be shown on permit plans.
- The project has been determined to be a water-dependent use, pursuant to the regulations at 310 CMR 9.12(2), and will require a Chapter 91 Permit for dredging and beach nourishment below the Mean High Water (MHW) line.
- Dredging and beach nourishment were previously authorized in part under Permit No. 229, issued July 2, 1992. According to the ENF, other prior authorizations exist, including DPW Contract #2468 (1965) and DEM Contract No. 3253(1993). Copies of all of these will need to be included in the Chapter 91 Permit application.
- Due to the presence of eel grass, as identified by the Town of Nantucket, the Waterways Regulations at 310 CMR 9.40(2) require that the design and timing of dredging and dredged material disposal activity shall be as such as "to minimize adverse impacts to submerged aquatic vegetation." The Town will also be required to provide post dredge and nourishment surveys showing that adverse impacts to eel grass have been avoided or minimized. Permanent impacts to eelgrass may be required to be mitigated in consultation with MDMF.
- The Town of Nantucket is advised to consult with the MDMF, prior to filing applications, to determine any Time of Year (TOY) restrictions, when dredging is prohibited, that may be required. Refer to the Standards for Dredging and Dredged Material Disposal section of the Waterways regulations {310 CMR 9.40(2)}.
- Dredged sediments will be beneficially reused as beach nourishment, and deposited on fourteen (14) private properties, located both above and below the MHW line. Placement below the MHW line is within Chapter 91 jurisdiction. Therefore, any publicly-funded dredging project where dredge spoil is placed below MHW on private property will require public access easements according to 310 CMR 9.40(4)(a)1. As stated in the ENF, the Town of Nantucket is working to secure these required public access easements.
- It is the Program's opinion that any additional issues can be addressed through the Notice of Intent, Chapter 91 and 401 WQC permitting.

Bureau of Waste Site Cleanup

Based upon the information provided, the Bureau of Waste Site Cleanup (BWSC) searched its databases for disposal sites and release notifications that may have occurred within and around the proposed project area. A disposal site is a location where there has been a release to the environment of oil and/or hazardous material that is regulated under M.G.L. c. 21E, and the Massachusetts Contingency Plan [MCP – 310 CMR 40.0000].

The proposed project involves harbor dredging, and stabilization and beach nourishment of private shoreline in the immediate vicinity. There are no listed disposal sites located at or within one mile of the proposed project area. The MCP compliance status of BWSC disposal sites may be viewed using the BWSC Waste Sites/Reportable Release Lookup at: <http://public.dep.state.ma.us/SearchableSites2/Search.aspx>

The Project Proponent is advised that if oil and/or hazardous material are identified during the implementation of this project, notification pursuant to the Massachusetts Contingency Plan (310 CMR 40.0000) must be made to MassDEP, if necessary. A Licensed Site Professional (LSP) should be retained to determine if notification is required and, if need be, to render appropriate opinions. The LSP may evaluate whether risk reduction measures are necessary or prudent if contamination is present. The BWSC may be contacted for guidance if questions arise regarding cleanup.

Proposed s.61 Findings

The “Certificate of the Secretary of Energy and Environmental Affairs on the Environmental Notification Form” may indicate that this project requires further MEPA review and the preparation of an Environmental Impact Report. Pursuant to MEPA Regulations 301 CMR 11.12(5)(d), the Proponent will prepare Proposed Section 61 Findings to be included in the EIR in a separate chapter updating and summarizing proposed mitigation measures. In accordance with 301 CMR 11.07(6)(k), this chapter should also include separate updated draft Section 61 Findings for each State agency that will issue permits for the project. The draft Section 61 Findings should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation.

The MassDEP Southeast Regional Office appreciates the opportunity to comment on this proposed project. If you have any questions regarding these comments, please contact Sharon Stone at (508) 946-2846.



Paul J. Diodati
Director

Commonwealth of Massachusetts

Division of Marine Fisheries

251 Causeway Street, Suite 400

Boston, Massachusetts 02114

(617) 626-1520

fax (617) 626-1509



Deval Patrick
Governor
Maeva Valley Bartlett
Secretary
Mary B. Griffin
Commissioner

August 27, 2014

Secretary Maeva Valley Bartlett
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Purvi Patel, EEA No. 15241
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Secretary Bartlett:

The Division of Marine Fisheries (*Marine Fisheries*) has reviewed the Environmental Notification Form by the Town of Nantucket to perform maintenance dredging and beach nourishment. Maintenance dredging is proposed for the Polpis Harbor Entrance Channel covering an area of approximately 69,039 square feet with 8,300 cubic yards of sediment removal to restore the channel to a depth of -6.0 feet at MLW with a one foot allowable overdredge to -7.0 feet. Sediment removed in the dredging portion is proposed for use as beach nourishment for a 3,000 linear foot section of shoreline on Nantucket Harbor to the southwest of the dredge site. Existing marine fisheries resources in these two project regions and potential project impacts to such resources are described in the following paragraphs.

Both the proposed dredge and nourishment sites are mapped shellfish habitat for bay scallop (*Argopecten irradians*) and quahog (*Mercenaria mercenaria*). Waters within the project sites have habitat characteristics suitable for these species. Land containing shellfish is deemed significant to the interest of the Wetlands Protection Act (310 CMR 10.34) and the protection of marine fisheries. Both areas are currently classified as Approved for shellfish harvest. Shellfish aquaculture grants are also located near the dredge site near the entrance to Polpis Harbor.

Both sites have also been mapped as eelgrass (*Zostera marina*) meadows, one of the most productive habitats types for numerous marine species [1,2]. Historical mapping performed by DEP in 1995 and 2001 identified eelgrass bordering the shoreline of the entire proposed nourishment area. Mapping also identified eelgrass bordering the Entrance Channel to the west, north and south. Surveys performed in October 2013 by CLE Engineering confirmed the current presence of these historically mapped beds. Eelgrass has declined in Massachusetts by approximately 20% in the past decade, an estimated 3 acres of eelgrass lost per year [3]. Every effort should be made to avoid impacts to eelgrass.

Sections of the proposed nourishment site contain salt marsh vegetation. Salt marsh provides a variety of ecosystem services, including habitat and energy sources for many fish and invertebrate species [4,5,6].

Polpis Harbor and bordering Nantucket Harbor have been identified by *Marine Fisheries* as spawning habitat for winter flounder (*Pseudopleuronectes americanus*). Winter flounder enter the area and spawn from January through May, laying clumps of eggs directly on the substrate. These demersal eggs hatch approximately fifteen to twenty days later. The Atlantic States Marine Fisheries Commission has designated winter flounder spawning habitat as "Habitat Areas of Particular Concern" (HAPC). A recent stock assessment has determined that Southern New England/Mid Atlantic winter flounder populations are at only 16% of the recommended recovery level [7]. Because of the winter flounder stock status, every effort should be made to protect winter flounder and their spawning habitat.

Marine Fisheries offers the following comments for your consideration:

Dredging:

- In the ENF, the proponent states: "Proposed dredge and nourishment areas do not contain eelgrass" (K. Mitigation Measures). While neither project component will directly impact eelgrass, indirect impacts could occur without sufficient buffer between activities and existing eelgrass. For the dredge portion, the top of the slope plus overdredge should remain at least 25 meters from all eelgrass beds.
- A time of year (TOY) restriction of **January 15 to May 31** is recommended for all in-water silt-producing work to minimize impacts to spawning winter flounder and their demersal eggs [30].
- Dredging practices should be performed in coordination with local aquaculture grant operators to avoid impacts to these operations.

Beach Nourishment:

- Transport of nourishment material to nearshore waters containing eelgrass could result in loss of this resource. Recent studies indicate that as little as 2 to 4 cm of sand burial can result in 70 to 90% mortality of eelgrass [8,9]. Proposed deposition of fill material to the MLW line leaves little buffer between introduced sediment and bordering eelgrass beds. Deposition in the intertidal zone may also impact existing shellfish and infaunal invertebrate populations. Beach fill should be placed above the MHW mark. Placing this material high on the beach facilitates a more gradual distribution of sediment, allowing mobile organisms to avoid the area of impact and burrowing organisms to respond to a smaller sediment load [28]. This approach would also provide a larger buffer between sediment deposition and nearshore eelgrass beds. If intertidal deposition is permitted, the proponent should develop an eelgrass monitoring plan in coordination with *Marine Fisheries* for the site to evaluate potential post-nourishment impacts to bordering beds.
- The proposed nourishment footprint includes deposition directly over existing salt marsh vegetation, with an estimated impact to 974 square feet of marsh vegetation. In the ENF, the proponent states: "These degraded marsh remnants are no longer considered to play a role in the protection of marine fisheries or wildlife habitat, prevention of pollution, ground water supply or storm prevention. Therefore, impacts resulting from proposed nourishment activities (fill) are not considered to be significant to the aforementioned interests" (Project Narrative – Salt Marsh P. 14 of 21). Fringing marsh vegetation is still

present in this region and should be considered significant as marine fisheries habitat. Beach fill should not be deposited over existing vegetation as this activity would most likely result in the complete loss of remaining marsh vegetation in this region.

Questions regarding this review may be directed to John Logan in our New Bedford office at (508) 990-2860 ext. 141.

Sincerely,



Paul J. Diodati
Director

PD/jl/sd

cc: Nantucket Conservation Commission
JC Johnson, Shellfish Constable
Christopher Boelke, Alison Verkade, NMFS
Robert Boeri, CZM
Ed Reiner, EPA
Ken Chin, DEP
Richard Lehan, DFG
Neil Churchill, Kathryn Ford, Christian Petitpas, DMF

References

1. Jackson EL, Rowden AA, Attrill MJ, Bossey SJ, Jones MB (2001) The importance of seagrass beds as a habitat for fishery species. *Oceanography and Marine Biology: an Annual Review* 39: 269-303.
2. Heck KL, Jr., Carruthers TJB, Duarte CM, Hughes AR, Kendrick G, et al. (2008) Trophic transfers from seagrass meadows subsidize diverse marine and terrestrial consumers. *Ecosystems* 11: 1198-1210.
3. Costello CT, Kenworthy WJ (2011) Twelve-year mapping and change analysis of eelgrass (*Zostera marina*) areal abundance in Massachusetts (USA) identifies statewide declines. *Estuaries and Coasts* 34: 232-242.
4. Boesch DF, Turner RE (1984) Dependence of fishery species on salt marshes: the role of food and refuge. *Estuaries* 7: 460-468.
5. Deegan LA, Garritt RH (1997) Evidence for spatial variability in estuarine food webs. *Marine Ecology Progress Series* 147: 31-47.
6. Deegan LA, Hughes JE, Rountree RA (2000) Salt marsh ecosystem support of marine transient species. In: Weinstein MP, Kreeger DA, editors. *Concepts and Controversies in Tidal Marsh Ecology*. Kluwer Academic Publisher, The Netherlands. pp. 333-365.
7. Northeast Fisheries Science Center (2011) 52nd Northeast Regional Stock Assessment Workshop (52nd SAW) Assessment Report. 962 p.
8. Cabaço S, Santos R, Duarte CM (2008) The impact of sediment burial and erosion on seagrasses: a review. *Estuarine, Coastal and Shelf Science* 79: 354-366.
9. Mills KE, Fonseca MS (2003) Mortality and productivity of eelgrass *Zostera marina* under conditions of experimental burial with two sediment types. *Marine Ecology Progress Series* 255: 127-134.



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

October 4, 2016

David Fronzuto
Town of Nantucket
16 Broad Street
Nantucket, MA 02554

Re: **COMBINED PERMIT - CHAPTER 91 PERMIT and 401 WATER QUALITY
CERTIFICATION**

Application for BRP WW 26

COMBINED PERMIT FOR DREDGING – MAJOR/MINOR PROJECT

At: Polpis Harbor, NANTUCKET

401 WQC Transmittal No: X269790
Chapter 91 Permit No: 14251
Wetlands File No: SE48-699
ACoE Application No:

Dear Mr. Fronzuto:

The Department has reviewed your application for a combined Chapter 91 Dredge Permit and Water Quality Certification ("Combined Permit"), referenced above. In accordance with the provisions of Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 et seq.), MGL c.21, §§ 26-53, 314 CMR 9.00 and MGL c.91, 310 CMR 9.00, the Department has determined there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law.

The waters of Polpis Harbor are designated in the Massachusetts Surface Water Quality Standards as Class SA. Such waters are intended "as excellent habitat for fish, other aquatic life and wildlife and for primary and secondary contact recreation." Anti-degradation provisions of these Standards require that "existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected."

Background: Polpis Harbor is located approximately 3 miles northeast of the entrance to Nantucket Harbor. It is an active waterfront utilized by recreational and commercial vessels. Due to its geographic location, Polpis Harbor is also a haven of storm refuge for boaters.

On May 29, 1992, the Department issued a 401 Water Quality Certification, transmittal # 21929, to the Town of Nantucket to dredge the Polpis Harbor entrance channel. On July 2, 1992, Chapter 91 Permit No. 229 was also issued to the Town of Nantucket to dredge the same channel.

Proposed project: The proposed project scope entails conducting maintenance dredging within previously authorized dredge limits, to a design depth of -6.0 feet Mean Low Water (MLW), including a 1-foot allowable overdredge to -7.0 feet MLW and 3H:1V side slopes. The estimated dredge volume is 8,300 yd³.

Dredging will be performed using either hydraulic or mechanical methods. Mechanical methods will consist of a barge-mounted excavator or crane with a closed bucket placing the dredged material into a barge/scow. Hydraulic methods will consist of a suction-cutterhead and the sediment slurry will be pumped directly into a barge/scow to allow for settling and the supernatant effluent will be pumped back into Polpis Harbor. The scow will then be transported with the aid of a tug boat to the Steamship Authority wharf and transferred where the dredged material will be off-loaded onto dump trucks and brought to the DPW yard located at 188 Madaket Road and a vacant lot located off New South Road near the Airport to be stockpiled. Both locations are to be permitted as Intermediate Facility (IF) under 314 CMR 9.07(4).

Eelgrass: An eelgrass survey was conducted in October 2013, adhering to the recommended methodologies presented in the MA Division of Marine Fisheries (DMF) Technical Report TR-43 "*Technical Guidelines for the Delineation, Restoration, and Monitoring of Eelgrass (Zostera marina) in Massachusetts Coastal Waters*". An underwater video camera with a monitor was utilized to visually confirm the presence of eelgrass along each survey transect. The locations shown to contain eelgrass were tagged using GPS so that the limits of existing eelgrass could be determined relative to proposed dredging and nourishment activities.

Based on the eelgrass survey, the proposed dredge plan was developed to entirely avoid direct impacts to the confirmed eelgrass areas within or in close proximity to the limits of the authorized channel (see Special Conditions 17-21)

ALTERNATIVES ANALYSIS: Three alternatives were evaluated for this project:

Alternative 1- No Dredge: Under this alternative, dredging would not be performed within the existing authorized entrance channel, and navigation conditions would continue to deteriorate. Shoaling would continue to increase, reducing tidal flushing and increasing the potential for vessel groundings that may result in spill and/or release of oil and hazardous material (OHM) into the harbor or sediment suspension from prop wash of the vessel. For these reasons, Alternative 1 was eliminated.

Alternative 2 - Maintenance Dredging: Under Alternative 2, maintenance dredging would be performed within all areas within the established limits of the existing navigation channel that are above the authorized depth of -6.0 feet MLW. Implementation of this alternative would restore/improve navigation, public access and use and tidal flushing within the waterway; however, it also would result in a direct impact to approximately ±32,030 SF (±0.7 acres) of existing/confirmed eelgrass habitat that is located within the southern-most reach of the 100-foot wide channel. Alternative 2 is not considered a viable option due the direct impacts to eelgrass habitat that would result from dredging.

Alternative 3 - Modified Maintenance Dredging: Under Alternative 3, maintenance dredging is proposed to restore areas within the existing navigation channel that are above the authorized depth of -6.0 feet MLW, with the exception that no dredging is proposed within the southernmost reach of the existing 100-foot wide channel due to the presence of eelgrass. Instead, channel access will be relocated slightly east to where existing water depths are currently at a minimum -5.0 feet MLW or deeper. Channel markers will be placed by the Town that delineates a 50-foot wide access channel at this location of the harbor. Alternative 3 was the preferred alternative.

Beneficial reuse: The dredged material will be beneficially reused to restore and enhance coastal resiliency along the eroding shorelines of Nantucket.

Proposed Nantucket Sand Bank: While the Town of Nantucket prefers to nourish its public shoreline area(s), these areas are not always available due to the need of nourishment and the need/timing of the dredge does not always arise at the same time. Private eroding beaches may be nourished if easements for public access below the existing high water mark can be secured from the owner of the beach to be nourished. However, the Town has not been successful in obtaining all the easements for public access in the past two years. As a result, the Town decided to establish a Sand Bank in order to proceed with the dredging of the Polpis Harbor channel and to allow the dredged material to be available for beneficial reuse at both publicly and privately owned eroding beaches.

The Sand Bank will provide the Town of Nantucket more flexibility in managing and reusing dredged material for nourishment. The Town is currently in the initial planning phase required to implement a comprehensive dredge program and has secured the necessary funding to proceed with the related design and permitting efforts. A preliminary island-wide matrix has been developed by the Town identifying potential dredge and beach nourishment sites (see Attachment 1).

The Town has conducted a precursory assessment of potential private parties interested in purchasing dredged sediments and confirmed that there is a significant demand for sand. The Town also confirmed that there is a shortage of available material from upland sources and the price per cubic yard of sand ranged from \$40 to \$52. Multiple parties expressed interest in purchase the dredged sand from Polpis Harbor due to an immediate need of material and potential cost savings for not purchasing from upland sources. The interested parties understand that a valid Order of Conditions from the Conservation Commission would be required and beach public access easement in-hand.

Based on the response of the private entities, it is anticipated that 80 percent of the dredged sediment from Polpis will be purchased by the interested private entities. Prior to commencement of the maintenance dredging of Polpis Harbor, the Town of Nantucket will finalize the purchase agreement with all the interested private parties. The purchase agreement will include:

1. proof of existing valid permit authorization for beach nourishment at the property of interest;

2. copy of all applicable public beach access easements that have been secured for the public use of the private land being nourished with dredged material from the publicly funded dredging project, and
3. payment for the quantity of beach sand to be purchased and picked up for further distribution.

No dredged sediment will be sold by the Town to any private entity that does not have the required public access easement(s) in-hand. The Town will administer and monitor the purchase protocol to ensure proper authorization(s) and documentation(s) are in place for the dredged material to be distributed amongst the approved private entities.

Once the dredged sand is transported from the barge to Steamship Wharf where it will be unloaded onto trucks and distributed to the private properties with the final purchased agreement. Any of the dredged sand that is not purchased by private entities will be trucked and placed at the designated Intermittent Facilities for stockpile. The stockpiled material will be available for reuse on as-needed basis and will provide an established/authorized reuse location.

The proceeds generated under the Sand Bank will be allocated to the Town's General Fund for future dredging and nourishment project. Dredging and nourishment projects funded by this source of revenue are considered as public funded projects. Private entities interested in purchasing the sand will have to abide by the above conditions (Michael Counts, personal communication-electronic mail dated September 22, 2016).

Sediment sampling data: Nine core samples were collected within the proposed dredge footprint for gradation analysis. Results of the gradation analysis showed all nine sediment samples contained less than ten percent of particles (0.5 percent to 3 percent) passing the No. 200 U.S. Standard Series Testing Sieve.

In accordance with 314 CMR 9.07(2)(a), no chemical testing is required if the sediment to be dredged contains less than ten percent of particles passing the No. 200 U.S. Standard Series Testing Sieve, and if the required "due diligence review" demonstrates to the Department's satisfaction that the area is unlikely to contain anthropogenic concentrations of oil or hazardous materials. As such, Special Condition no. 9 requires a due diligence review be conducted and its findings be submitted to the Department.

Dredged Material Dewatering: Based on the results of the gradation analysis, very little or no dewatering will be required for the dredged material. In this case, the dredged material will settle rapidly in the barge/scow and the supernatant effluent will return back to the Nantucket/Polpis Harbor.

Rare Species and Rare Wildlife Habitat: The site is located within the Priority Habitats of Rare Species, Estimated Habitats of Rare Wildlife, and Certified Vernal Pools in accordance with the Massachusetts Natural Heritage Atlas, 13th Edition. According to a letter dated March 18, 2015, from the Division of Fisheries & Wildlife, Natural Heritage & Endangered Species Program (NHESP), it has determined that this project as proposed must be conditioned in order to avoid adverse effect the actual Resource Area Habitat of state-protected rare wildlife species and a prohibited "take" (see Special Condition 16).

Public Notice: The public notice of the Chapter 91 dredge and 401 WQC combined application was published in the Nantucket Inquirer and Mirror on May 19, 2016. The Department did not receive any comment during the 21-day public comment period under 314 CMR 9.05(3)(e) and the 15-day public comment period under 310 CMR 9.13(1)(c)5, which ended on June 9, 2016 and June 3, 2016 respectively.

Section 61 Findings: Pursuant to M.G.L. Chapter 30, Sections 61 to 62H (M.E.P.A.) this project was reviewed as EOE No. 15241 and the Secretary's Certificate, issued on September 5, 2014 found that t an Environmental Impact Report (EIR) was not required.

Therefore, based on information currently in the record, the Department grants a Combined Permit for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law. The Department further certifies in accordance with 314 CMR 9.00 that there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law. Finally, the Department has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00

STANDARD COMBINED PERMIT CONDITIONS:

1. Acceptance of this Combined Permit shall constitute an agreement by the Applicant to conform to all terms and conditions stated herein.
2. This Combined Permit is issued upon the express condition that any and all other applicable authorizations necessitated due to the provisions hereof shall be secured by the Applicant prior to the commencement of any activity hereby authorized.
3. This Combined Permit shall be revocable by the Department for noncompliance with the terms and conditions set forth herein. This Combined Permit may be revoked after the Department has given written notice of the alleged noncompliance to the Applicant, or his agent, and those persons who have filed a written request, with the Department, for such notice and have afforded the Applicant a reasonable opportunity to correct said noncompliance.
4. This Combined Permit is issued subject to all applicable federal, state, county, and municipal laws, ordinances, by-laws, and regulations, including but not limited to, a valid Order of Conditions issued pursuant to the Wetlands Protection Act, M.G.L. Chapter 131, s.40.
5. This Combined Permit is issued upon the express condition that dredging and transportation and disposal of dredge material shall be in strict conformance with all applicable requirements and authorizations of the Department.
6. The Applicant shall assume and pay all claims and demands arising in any manner from the work authorized herein, and shall save harmless and indemnify the Commonwealth of

Massachusetts, its officers, employees, and agents from all claims, audits, damages, costs and expenses incurred by reason thereof.

7. Dredging under this Combined Permit shall be conducted in a manner not to cause unnecessary obstruction of the free passage of vessels. When conducting authorized dredging, care shall be taken not to cause any shoaling. If, however, any shoaling is caused, the Applicant shall, at his expense remove the shoal areas. The Applicant shall pay all costs of supervision, and if at any time the Department deems necessary a survey or surveys of the area dredged, the Applicant shall pay all costs associated with such work. Nothing in this Combined Permit shall be construed as to impair the legal rights of any persons, or authorize dredging on land not owned by the Applicant without consent of the owner(s) of such property.

SPECIAL COMBINED PERMIT CONDITIONS

1. The Contractor shall take all steps necessary to assure that the proposed activities will be conducted in a manner that will avoid violations of the anti-degradation provisions of the Massachusetts Surface Water Quality Standards that protect all waters, including wetlands.
2. Prior to the start of work, or any other portion of the work thereafter, the Department shall be notified of any change(s) in the proposed project or plans that may affect waters or wetlands. The Department will determine whether the change(s) require a revision to this Combined Permit.
3. Dredging in accordance with this Combined Permit may begin following the 21-day appeal period and once all other Permits have been received.
4. Work in waters and wetlands shall conform to Part E – Proposed Scope of Project and Use Activity Description and plans/figures submitted in this application to the Department, 11 sheets prepared by CLE Engineering, Inc., dated April 1, 2016, and are unsigned and unstamped. The Department shall be notified if there are modifications and or deletions of work as specified in the plans. Depending on the nature and the scope of any change, approval by the Department may be required.
5. The applicant and its contractor shall allow agents of the Department to enter the project sites to verify compliance with the conditions of this Combined Permit.
6. The Department shall be notified, attention Ken Chin 617-292-5893, one week prior to the start of in-water work so that Department staff may inspect the work for compliance with the terms and conditions of this Combined Permit.
7. The term of the Chapter 91 dredge permit of this Combined Permit is five years in accordance with 310 CMR 9.15(2). The term of the 401 WQC dredging of the Combined Permit remains in effect for the same duration as the federal permit that requires it or five years from the date of issuance of this Combined Permit whichever comes first.

8. The applicant may request an extension of the 401 dredging of the Combined Permit in accordance with 314 CMR 9.09(3). If the Department grants an extension, the Chapter 91 dredge permit of the Combined Permit will also be extended for the same term.
9. Within 21 days of issuance of the Combined Permit, the applicant shall perform a due-diligence review in accordance with 314 CMR 9.07(2)(a) to determine that no known spills of oil or other toxic substances have occurred which could have contaminated the sediment in the proposed dredge area(s). The findings of the due-diligence review shall be submitted to the Department prior to commencement of the dredging activity.
10. Future maintenance dredging may be conducted as necessary for the duration of this Combined Permit, provided that:
 - a. the initial project and any subsequent dredging has been conducted satisfactorily with no violations of the terms and conditions of this Combined Permit or any violations which did occur have been resolved to the satisfaction of the Department;
 - b. Confirm that the private entity has a valid permit for the beach nourishment activity;
 - c. information has been submitted to the Department, if applicable, regarding chemical characteristics and final end use/disposal of the dredged material for review and approval and no future maintenance dredging has commenced without obtaining end use/disposal approval from the Department;
 - d. **Documentation** showing the grain-size distribution of the sediment to be dredged is compatible with the grain-size distribution of the **approved** receiving beach(es) in accordance with the document entitled Beach Nourishment, Mass DEP's Guide to Best Management Practices for Projects in Massachusetts, March 2007 and is submitted to the Department;
 - e. coordinates of the maintenance dredge footprint are the same as the dredge footprint authorized under this Certification;
 - f. a current due-diligence evaluation is done to determine that no known spills of oil or other toxic substances have occurred which could have contaminated the sediment in the dredge area and submitted to the Department prior to maintenance dredging;
 - g. a bathymetric survey has been submitted to the Department in compliance with Condition no. 21;
 - h. the volume of future maintenance dredging does not exceed 8,300 cubic yards and the Department is notified prior to commencement of maintenance dredging.
11. The Town shall maintain all final purchase agreements. At a minimum, the purchase agreement shall include the following information:
 - a. name of the private entity;
 - b. address of the nourishment location;
 - c. copy of the **valid** permit for nourishment;
 - d. public beach access agreement;
 - e. quantity of sand purchased and price per cubic yard.

Copy of the purchase agreement shall be provided to the Department upon request.

12. When conducting future maintenance dredging at Station 3+00 and 17+00 of the entrance channel adjacent to Quaise Point, equipment such as a long reach excavator shall be situated above the Mean High Tide (MHT) line. Any temporary impact to the coastal beach

shall be restored back to the pre-dredging condition. In the event that dredging cannot be carried out above the MHT line or cause additional impact to other wetland resources, the applicant or its contractor shall submit a proposed work plan to the Wetlands and Waterways Program, Attn: Ken Chin for review and approval. Dredging may not commence without obtaining the approval from the Department.

13. Best Management Practices (BMPs) such as a silt curtain shall be deployed surrounding the dredge area to minimize turbidity. At a minimum, the silt curtain shall be bottom-weighted to minimize the degree of lifting/flailing or billowing and shall be of suitable material/grade appropriate based on the velocity of the current at the site. Intermediate vertical floats or other means shall be placed on the silt curtain to lift the bottom of the silt curtain at low tide so that the bottom edges of the curtain remain close to the mudline at low tide but do not rake the sediment in areas subject to tidal influence. Dredging shall be carried out using a closed, environmental bucket if the sediment does not consist solely of densely compacted silt/clay.
14. Best Management Practices (BMPs) shall be implemented during transportation of the dredged material to the licensed receiving facility. At a minimum, when transported upon public roadways, all dredged material shall have no free liquid as determined by the Paint Filter Test or other suitably analogous methodology acceptable to the Department, and a tarpaulin or other means shall be used to cover the dredged material during transport.
15. Disposal of any volume of dredged material at any location in tidal waters is subject to approval by this Department and the Massachusetts Coastal Zone Management office.
16. The applicant shall comply with the conditions set forth in the March 15, 2015 letter issued by the Natural Heritage Endangered Species Program of the Division of Fisheries & Wildlife.
17. If it is feasible, a buffer of 100 feet shall be maintained between the top of slope of the channel and any identified bordering eelgrass beds.
18. In area where the buffer is less than 100 feet, a pre-and post-dredge eelgrass survey shall be conducted. The eelgrass survey protocol shall be submitted electronically to the Wetlands and Waterway Division in the Boston Office, attn.: Ken Chin, and to the Division of Marine Fisheries (DMF) (DMF.EnvReview-South@state.ma.us) for review and approval prior to commencement of the dredging activity of Polpis Harbor.
19. The approved pre-dredge eelgrass survey should be performed during the eelgrass growing season in May or September. Of these two potential survey months, whichever most closely precedes the planned dredge activity shall be selected. The approved post-dredge surveys should be performed in the same growing season selected in the pre-dredge survey. Survey results shall be submitted to the Department and DMF for review. Any eelgrass loss documented through the survey will require mitigation according to a mitigation plan developed in coordination with DEP and DMF.
20. Prior to construction, all contractors will be made aware of eelgrass in the project vicinity and be instructed to avoid eelgrass at all times during construction activities. Any eelgrass beds within 500 feet of the construction footprint should be marked with buoys prior to construction to facilitate avoidance.

21. Within 90 days of the completion of the initial dredging and any future maintenance dredging to be conducted authorized under this Combined Permit, a bathymetric survey of the dredged area within [name of the waterbody] depicting post-dredge conditions shall be conducted. At a minimum, the survey shall include an overlay of the dredge footprint (i.e. top of slope) with sufficient coordinates in the Massachusetts State Plane (e.g. longitude and latitude) to clearly delineate the dredge footprint. The survey shall be submitted within five working days after its completion to the Department and a copy shall be sent to the Massachusetts Coastal Zone Management office, attention: Robert Boeri. This submittal shall also include a cross section or profile showing the water depths at mean low water within the dredge footprint.
22. In order to protect spawning, larval and juvenile development of winter flounder, no dredging shall occur between January 15th and May 31st.

The applicant, or its contractor, shall make every feasible effort to complete the project within the Combined Permitted timeframe. Should the applicant, or their contractor, fail to complete the project and wish to request an amendment to the Combined Permit for incursion into the no-dredge period, the written request shall be received by the Department by January 2nd. The following information shall be included in the request:

- a. project location and transmittal number,
- b. the date on which dredging started,
- c. the number of days and hours per day the dredge operated,
- d. expected daily average production rate and the actual daily average production rate,
- e. an explanation of why the project failed to remain on schedule,
- f. an account of efforts made to get the project back on schedule,
- g. a plan depicting the areas that remain to be dredged,
- h. the number of cubic yards that remain to be dredged,
- i. an accurate estimate of the number of days required to complete the project,
- j. an evaluation of the impact of continued dredging on the species of concern,
- k. a description of any efforts that will be made to minimize the impacts of the project on the species of concern, and a realistic assessment of any societal/financial effects of a denial of permission to continue dredging.

The Department will share the information with other resource agencies and a decision to grant or deny the amendment shall be made by January 15th. Requests for amendment received after January 2nd will be considered at the Department's discretion.

23. No later than four weeks after issuance of the Combined Permit, the applicant shall submit a notification procedure outlining the reporting process to the Department for incidents, relating to the dredging activities, impacting surrounding resource areas and habitats such as, but not limited to, observed dead or distressed fish, or other aquatic organisms, observed oily sheen on surface water, sediment spill, turbidity plume beyond the deployed BMP's, and barging or equipment accident/spill. If at any time during implementation of the project any incident environment impacts such as those listed above, all site related activities impacting the water shall cease until the source of the problem is identified and adequate mitigating measures employed to the satisfaction of the Department.

Failure to comply with this Combined Permit is grounds for enforcement, including civil and criminal penalties, under MGL c.21 §42, 314 CMR 9.00, MGL c. 21A §16, 310 CMR 5.00, MGL c.91, 310 CMR 9.00 or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

This Combined Permit does not relieve the applicant of the obligation to comply with other applicable state or federal statutes or regulations. Any changes made to the project as described in the previously submitted Notice of Intent, Combined Permit application, or supplemental documents will require further notification to the Department.

NOTICE OF APPEAL RIGHTS

Chapter 91 Appeal Process (310 CMR 9.17)

Pursuant to 310 CMR 9.17(1)(a) and 9.17(2), the applicant may appeal this decision within twenty-one (21) days of the date of Combined Permit issuance, by submitting a written request, by certified mail, for an adjudicatory hearing. Any notice of claim for an adjudicatory hearing must include the following information: the DEP Combined Application license/permit Number; the complete name, address and telephone number of the party filing the request; if represented by counsel, the name, address and telephone number of the attorney; a clear statement that a formal adjudicatory hearing is being requested; and a clear and concise statement of the specific objections to the Department's license decision, and the relief sought through the adjudicatory hearing, including, specifically, the changes desired in the final Combined Permit.

The following persons shall have the right to an adjudicatory hearing concerning this decision by MassDEP to grant or deny a license or Combined Permit, in accordance with 310 CMR 9.17(1):

- a. an applicant who has demonstrated property rights in the lands in question, or which is a public agency;
- b. any person aggrieved by the decision of MassDEP to grant a Combined Permit who has submitted written comments within the public comment period;
- c. ten (10) residents of the Commonwealth who, pursuant to M.G.L. c. 30A, § 10A, have submitted comments within the public comment period with at least 5 of the 10 residents residing in the municipality(s) in which the Combined Permit activity is located. The appeal shall clearly and specifically state the facts and grounds for the appeal and the relief sought, and each appealing resident shall file an affidavit stating the intent to be part of the group and to be represented by its authorized representative;
- d. the municipal official in the affected municipality who has submitted written comments within the public comment period; and
- e. CZM, for any project identified in 310 CMR 9.13(2) (a) for CZM participation or, in an Ocean Sanctuary, if it has filed a notice of participation within the public comment period.

A person requesting an adjudicatory hearing must submit a "Notice of Claim" to the Department, with a copy of the MassDEP Transmittal Form and including the detail specified below, within twenty-one (21) days of the date of issuance of this decision. The MassDEP Fee Transmittal Form is available at the following website:

<http://www.mass.gov/eea/docs/dep/service/adr/adijherfm.doc>. The Notice of Claim must be made in writing and sent by certified mail or hand delivery to:

Case Administrator
MassDEP
One Winter Street, 2nd Floor
Boston, MA 02108

A copy of the complete Notice of Claim must be sent at the same time by certified mail or hand delivery to: (1) the applicant, (2) the municipal official of the city or town where the project is located, and (3) the issuing office of the MassDEP, which in this case is located at:

MassDEP Waterways Regulation Program
[appropriate Regional Office address]

The MassDEP Fee Transmittal Form and a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100) must be mailed to:

Mass. Department of Environmental Protection
Commonwealth Master Lockbox
P.O. Box 4062
Boston, Massachusetts 02211

Information must be included in the hearing request

Pursuant to 310 CMR 9.17(3), any Notice of Claim requesting an adjudicatory hearing must include the following information:

- a. the 401 Combined Permit Transmittal Number and MassDEP Waterways Application File Number;
- b. the complete name, address, fax number and telephone number of the applicant;
- c. the address of the project;
- d. the complete name, address, fax number, and telephone number of the party filing the request and, if represented by counsel, the name, address, fax number, and phone number of the attorney;
- e. if claiming to be a person aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found in 310 CMR 9.02;
- f. a clear statement that a formal adjudicatory hearing is being requested;
- g. a clear statement of the facts which are the grounds for the proceedings, the specific objections to the MassDEP's written decision, and the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written decision; and
- h. a statement that a copy of the request has been sent to: the applicant and the municipal official of the city or town where the project is located.

Dismissal of request

The request for appeal will be dismissed if the filing fee is not paid, unless the appellant is exempt or is granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal

housing authority. The Department may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

Please note that the Department may revoke this Combined Permit for non-compliance with the terms and conditions set forth. Therefore, it is recommended that you contact the Department prior to performing any alterations or use modifications for review and, if necessary, approval pursuant to M.G.L. Chapter 91.

401 WQC Appeal Process (314 CMR 9.10):

Certain persons shall have a right to request an adjudicatory hearing concerning Combined Permits by the Department when an application is required:

- a. the applicant or property owner;
- b. any person aggrieved by the decision who has submitted written comments during the public comment period;
- c. any ten (10) persons of the Commonwealth pursuant to M.G.L. c.30A where a group member has submitted written comments during the public comment period; or
- d. any governmental body or private organization with a mandate to protect the environment, which has submitted written comments during the public comment period.

Any person aggrieved, any ten (10) persons of the Commonwealth, or a governmental body or private organization with a mandate to protect the environment may appeal without having submitted written comments during the public comment period only when the claim is based on new substantive issues arising from material changes to the scope or impact of the activity and not apparent at the time of public notice. To request an adjudicatory hearing pursuant to M.G.L. c.30A, § 10, a Notice of Claim must be made in writing, provided that the request is made by certified mail or hand delivery to the Department, with the appropriate filing fee specified within 310 CMR 4.10 along with a DEP Fee Transmittal Form within twenty-one (21) days from the date of issuance of this Certificate.

Case Administrator
Department of Environmental Protection
One Winter Street, 2nd Floor
Boston, MA 02108.

A copy of the request shall at the same time be sent by certified mail or hand delivery to the issuing office of the Wetlands and Waterways Program at:

Department of Environmental Protection
One Winter Street, 5th Floor
Boston, MA 02108.

A Notice of Claim for Adjudicatory Hearing shall comply with the Department's Rules for Adjudicatory Proceedings, 310 CMR 1.01(6), and shall contain the following information pursuant to 314 CMR 9.10(3):

- a. the 401 Combined Permit Transmittal Number and DEP Wetlands Protection Act File Number;
- b. the complete name of the applicant and address of the project;
- c. the complete name, address, and fax and telephone numbers of the party filing the request, and, if represented by counsel or other representative, the name, fax and telephone numbers, and address of the attorney;
- d. if claiming to be a party aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found at 314 CMR 9.02;
- e. a clear and concise statement that an adjudicatory hearing is being requested;
- f. a clear and concise statement of (1) the facts which are grounds for the proceedings, (2) the objections to this Certificate, including specifically the manner in which it is alleged to be inconsistent with the Department's Water Quality Regulations, 314 CMR 9.00, and (3) the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written Combined Permit; and
- g. a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant, the owner (if different from the applicant), the conservation commission of the city or town where the activity will occur, the Department of Environmental Management (when the certificate concerns projects in Areas of Critical Environmental Concern), the public or private water supplier where the project is located (when the certificate concerns projects in Outstanding Resource Waters), and any other entity with responsibility for the resource where the project is located.

The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100) must be mailed to:

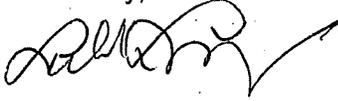
Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
P.O. Box 4062
Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. The Department may waive the adjudicatory-hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

Failure to comply with this Combined Permit is grounds for enforcement, including civil and criminal penalties, under MGL c.21 §42, 314 CMR 9.00, MGL c. 21A §16, 310 CMR 5.00, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

If you have questions about this decision, please contact Ken Chin at 617-292-5893.

Sincerely,



Lealdon Langley
Director
Wetlands and Waterways Program

enclosure: Departmental Action Fee Transmittal Form

ecc:

Barbara Newman, Regulatory/Enforcement Division, U.S. Army Corps of Engineers, 696 Virginia Road,
Concord, MA 01742-2751
Robert Boeri, CZM, 251 Causeway Street, Suite 800, Boston, MA 02114
John Logan, DMF, 1213 Purchase St., 3rd floor, New Bedford, MA 02740-6694
Carlos Fragata, Jim Mahala, DEP SERO
Michael Counts, CLE Engineering, Inc. 15 Creek Road, Marion, MA 02738 Consultant
Sheila Lucey, Harbor Master, 34 Washington Street, Nantucket, Ma 02554

cc: Nantucket Conservation Commission, 2 Bathing Beach Road, Nantucket, MA 02554

KC/X269790

Attachment E

Site Photographs

Photograph Log

Town of Nantucket
Maintenance Dredging



Photograph: 11.

Description:
Hither Creek

Location:
Nantucket Island, MA

Date: 9/4/2025



Photograph: 22.

Description:
Hither Creek

Location:
Nantucket Island, MA

Date: 9/4/2025

Photograph Log

Town of Nantucket
Maintenance Dredging



Photograph: 33.

Description:
Hither Creek

Location:
Nantucket Island, MA

Date: 9/4/2025



Photograph: 44.

Description:
Polpis Harbor

Location:
Nantucket Island, MA

Date: 9/3/2025

Photograph Log

Town of Nantucket
Maintenance Dredging



Photograph: 5

Description:
Polpis Harbor

Location:
Nantucket Island, MA

Date: 9/3/2025



Photograph: 65.

Description:
Polpis Harbor

Location:
Nantucket Island, MA

Date: 9/3/2025

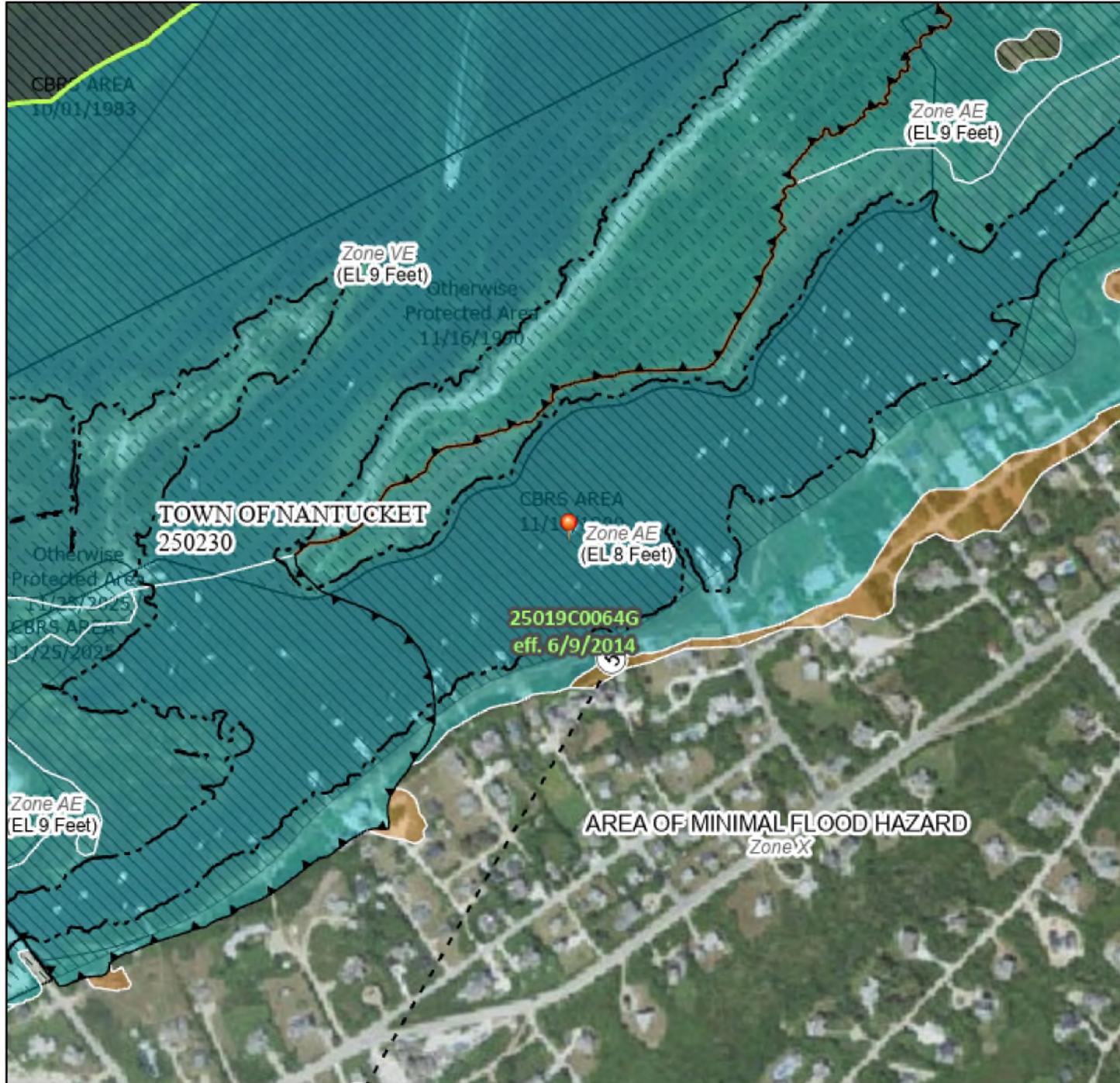
Attachment F

FEMA FIRM Panels

National Flood Hazard Layer FIRMMette



70°12'14"W 41°16'43"N



Legend

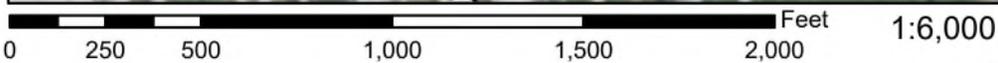
SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation 17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
	Hydrographic Feature	
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/22/2025 at 7:16 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



70°11'36"W 41°16'16"N

National Flood Hazard Layer FIRMette



70°1'39"W 41°18'32"N



1:6,000 70°11'W 41°18'5"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
	Profile Baseline	
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
	The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.	



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/22/2025 at 7:13 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Attachment G

Sediment Analyses



Client:	ARCADIS U.S., Inc.		
Project:	Nantucket Sediment Transport Study		
Location:	Hither Creek	Project No:	GTX-321799
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	09/18/25
Depth :	---	Tested By:	ajl
		Checked By:	jsc
		Test Id:	834458

Amount of Material Passing #200 Sieve - ASTM D1140

Boring ID	Sample ID	Depth	Visual Description	Fines, %
---	01PH1T -0-24-(9.3)	0-24"	Moist, pale brown sand with gravel and shell fragments	0.5
---	01PH2M -24-48-(9.3)	24-48"	Moist, pale brown sand with gravel and shell fragments	0.5
---	01PH3B -48-72-(9.3)	48-66"	Moist, pale brown sand with gravel and shell fragments	0.6
---	04PH1T -0-24-(9.3)	0-24"	Moist, very dark gray sandy silt	59.3
---	04PH2B -24-48-(9.3)	24-48"	Moist, very dark gray silty sand	43.3
---	3HC1- 0-24-(9.4)	0-13"	Moist, very dark gray silt with sand	70.1
---	7HC1T- 0-24-(9.4)	0-24"	Moist, dark olive brown sand with silt	7.1
---	7HC2M -24-48-(9.4)	24-48"	Moist, olive brown silty sand	15.3
---	7HC3B -48-72-(9.4)	48-65"	Moist, olive brown sand	4.4

Notes: Tests performed using Method B - washing using a wetting agent
 Dry mass of test specimen was determined directly



Client:	ARCADIS U.S., Inc.		
Project:	Nantucket Sediment Transport Study		
Location:	Hither Creek	Project No:	GTX-321799
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	09/18/25
Depth :	---	Test Id:	834451
		Tested By:	ajl
		Checked By:	jsc

Amount of Material Passing #200 Sieve - ASTM D1140

Boring ID	Sample ID	Depth	Visual Description	Fines, %
---	11HC1T -0-24-(9.4)	0-24"	Moist, very dark gray silty sand	42.2
---	11HC2M -24-48-(9.4)	24-48"	Moist, gray sand with gravel and shell fragments	1.5
---	11HC3B -48-72-(9.4)	48-51"	Moist, grayish brown sand	1.7
---	14HC1- 0-24-(9.4)	0-18"	Moist, very dark brown silty sand	17.8
---	18HC1T -0-24-(9.4)	0-24"	Moist, very dark brown sandy silt	57.8
---	18HC2B -24-48-(9.4)	24-30"	Moist, olive brown sand	2.6

Notes: Tests performed using Method B - washing using a wetting agent
 Dry mass of test specimen was determined directly



To: Arcadis
500 Edgewater Drive, Suite 511
Wakefield, MA 01880

From: Ryan M. Cavanaugh, PE
Senior Project Engineer

Date: September 11, 2023

Re: **Nantucket Harbors Sediment Transport, Dredging, and Beach nourishment
Fieldwork Memo**

Coastal Engineering Company (CEC) had joined Arcadis U.S. for Professional Engineering, Surveying, and Permitting Services for the above-mentioned project. As part of this, CEC performed bathymetric surveys in the three (3) areas requested and laid out by Arcadis: Madaket Harbor, Upper Harbor, and Polpis Harbor Channel. Prior to performing any survey, CEC surveyors established benchmarks across the island near the areas of survey as base stations to utilize Smartnet's RTK network which is under supported on the island.

Survey & Bathymetry

Survey control was established on May 1st, 2023, with bathymetry on the aforementioned areas being performed on May 2nd, and May 3rd, 2023. The bathymetry was performed with a single beam transducer, using an Echotrac E20 echosounder with a Leica GPS antenna mounted directly above the transducer to utilize the RTK network for tide corrections. In addition to utilizing the RTK network for tide corrections, CEC installed two (2) tide boards, one (1) at Madaket Harbor and one (1) within the upper harbor. The water levels measured by these tide boards were taken to cross reference the survey against the RTK network and provide backup data in the event the RTK network went down or did not provide data due to the survey location. Both tide boards were installed in locations that were accessible to personnel both on shore and on the water.

Prior to each survey, the equipment was calibrated against the water temperature and the transducer draft to best measure the actual mudline depth. Throughout the day soundings were taken beneath the transducer to quickly determine if the calibration settings were still sufficient for surveying. If soundings did not match what the survey equipment was measuring, then the survey was halted, and equipment recalibrated. Fortunately, for this survey, all intermittent soundings corroborated the readings of the equipment within a tenth (0.1) of a foot.

Bathymetry was done under conditions of low wind and waves as best as possible. When wave height was too large, the survey was halted and picked back up when conditions were more favorable.

Attached to this memo are figures that show representative depths approximately 50 feet apart in the surveyed areas. A .kmz file showing the areas was submitted by uploading to the shared server for the project.

Grab Samples

CEC conducted grab samples on the mudline at the locations given in order to determine the soil types and grain sizes on the surface of the mudline. The grab samples were conducted from the Coastal Engineering Hydrographic Survey boat which is a 22-foot C-Hawk with a pilot house. The samples were taken by dragging a bucket with a steel lip on the front behind the boat for a few feet and then brought aboard the boat. The samples were removed from the bucket and placed in sample bags and labeled.

The actual sample locations varied slightly in relation to the targeted GPS points for the sample locations. The ability to take the samples while the boat was moving made taking the samples closer to the targeted locations easier. However, some of the locations varied due to the water depth, the composition of the mudline, and the eelgrass bed locations. All of the samples were able to be collected except for the one at MH-7. This sample was located within a mass of eelgrass beds and the bottom composition made getting the sample tough. The channel next to the eelgrass beds was too deep, over 15 feet, for our sampling method to work. It was determined that due to the depth and eelgrass this sample could not be taken, and there was no suitable alternative location within proximity for any sample to be taken. This sample was attempted eight (8) times, over the course of 120 minutes.

The sediment samples were gathered in plastic bags and brought back to the CEC offices where it was processed. Each sample had a sieve analysis performed by a certified engineer at CEC.

Core Sampling

CEC conducted core sampling of the sediment on the mudline to analyze and determine the subsurface soil types and grain sizes. The core sampling was conducted from the Coastal Engineering Hydrographic Survey boat which is a 22-foot C-Hawk with a pilot house. The samples were taken using a vibratory hammer, suspended over the port side of the boat. The coring samples were collected using a 4-inch diameter 8-foot aluminum tube lined with a plastic sleeve with a core catcher riveted into the bottom. The sample collecting tube was attached to the vibratory hammer and then lowered over the side of the boat until the core collection tube settled on the mudline and then the vibratory hammer was turned on. The sample was removed from the core hole and brought back into the boat after the vibratory hammer stopped driving the collection tube further into the mudline.

The actual sample locations varied in relation to the targeted GPS points for the sample locations. The actual sample locations were chosen in the field due to the ability of the boat to maintain position, the water depth, and boat traffic. In order to maintain position two (2) anchors and the outboard motor were used to steady the boat in one (1) location. The variability in steady location of the boat was due to the tide and wind as well as how the anchors set into the mudline. The targeted sample locations were within the channels throughout the island. The channels often had water depths over 8 feet, and this was not a practical depth for the sediment coring set up on the boat. Additionally, due to the locations being within the channels, sometimes the anchor locations required blocking the channel entirely and this was deemed unsafe to the CEC crew and other boaters. The adjusted locations were kept as close

to the targeted location as practical, but being within the channel was prioritized over proximity occasionally.

The sediment samples were gathered in plastic tube bags and brought back to the CEC offices where it was processed. Each core was laid on the processing table and photographed with an identifying label and the core as it was pulled from the mudline. Other photos were taken depending on the quality and findings within the sample. The samples were analyzed based on physical observations from the engineers at CEC. A sieve analysis was performed by a certified engineer at CEC. The results helped determine which samples, and at what depths, the sand is suitable to be used as beach nourishment. Based on the Best Management Practices for Beach Nourishment by the Massachusetts Department of Environmental Protection borrow site sand should have less than 10% passing the No. 200 Sieve. The table below shows these results from each sample organized by area. All of the samples showed they have less than 10% passing the No. 200 Sieve and are suitable to be used in Beach Nourishment.

Core Sample		Beach Nourishment Compatible	Percent Passing
ID	Description		
Madaket Harbor			
1	MH-1 (16-27")	Yes	4.78%
2	MH-3 (7-14")	Yes	4.82%
3	MH-3 (14-21")	Yes	2.43%
4	MH-4 (5-14")	Yes	1.46%
5	MH-4 (21-33")	Yes	0.04%
6	MH-5 (0-9")	Yes	6.77%
7	MH-5 (9-19")	Yes	1.38%
8	MH-6 (0-14")	Yes	7.56%
9	MH-6 (14-26")	Yes	3.21%
10	MH-7 (0-6")	Yes	4.46%
11	MH-7 (6-17")	Yes	0.23%
12	MH-6 (0-14") RETEST	Yes	3.81%
13	MH-5 (0-9") RETEST	Yes	8.63%
14	MH-6 (14-26") RETEST	Yes	3.60%
15	MH-5 (9-19") RETEST	Yes	1.97%
Polpis Harbor			
1	PH-1	Yes	0.20%
2	PH-2	Yes	0.54%
Upper Harbor			
1	UH-1 (0-15")	Yes	0.20%
2	UH-2	Yes	0.35%

Attached to this memo are the core sample logs and sieve analysis data. The locations of the samples are included in the Bathymetry Survey Sheets and are attached at the end of the document.

APPENDIX A

BATHYMETRY DATA

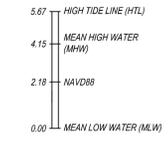




A POLPIS HARBOR CHANNEL BATHYMETRY - PLAN
SCALE: 1" = 100'-0"

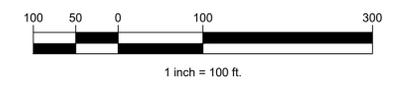
NOTES:

1. THIS PLAN IS REFERENCED HORIZONTALLY TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM OF 1983, ISLAND ZONE (NAD83 (2011) (MYCS2) EPOCH 2010.00). VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) BY RTK GPS OBSERVATIONS ON MAY 2 AND MAY 3, 2023 USING THE HXGN SMARTNET RTK NETWORK.
2. THIS PLAN IS THE RESULT OF A BATHYMETRIC SURVEY PERFORMED ON MAY 3, 2023. THE BATHYMETRY WAS PERFORMED WITH AN ECHOTRAC E20 SINGLE BEAM ECHOSOUNDER UTILIZING HYPACK 2022 SOFTWARE.
3. SOUNDINGS SHOWN ARE SPACED APPROXIMATELY 50 FEET APART AND ARE SHOWN ONLY FOR A VISUAL REPRESENTATION OF THE MUDLINE.
4. ACTUAL LOCATION OF SOUNDING IS LOCATED ON THE DECIMAL OF THE DEPTH.
5. EXISTING UTILITIES, UNDERGROUND AND OVERHEAD, MAY EXIST IN ADDITION TO THE UTILITY INFORMATION SHOWN ON THESE PLANS. THIS PLAN MUST NOT BE USED TO LOCATE UNDERGROUND UTILITIES. CALL DIG SAFE AT 811 PRIOR TO STARTING ANY EXCAVATION.
6. SURVEY SHOWN CAN ONLY REFLECT CONDITIONS AT THE TIME OF SURVEY



NOAA TIDAL PROFILE
STA. 8447355
MONUMENT BEACH
SCALE: 1" = 4"

HTL REF: BUZZARDS BAY
NATIONAL ESTUARY PROGRAM



NO.	DATE	REVISION	BY
1			MJB

SEAL
DRAFT

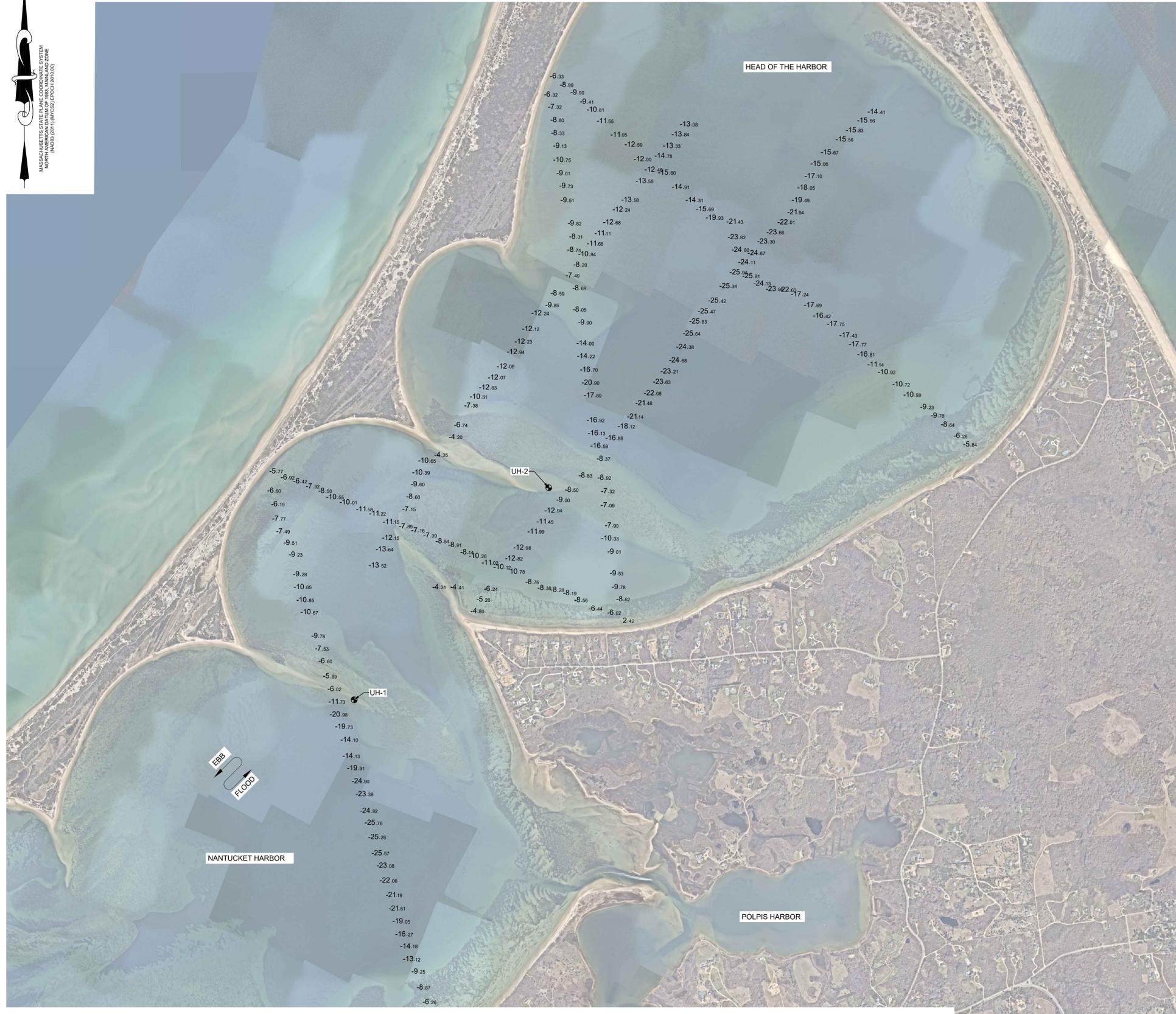
PROJECT: **ARCADIS HARBOR DREDGE STUDY** NANTUCKET, MA
SHEET TITLE: **POLPIS HARBOR CHANNEL EXISTING BATHYMETRY**

SCALE	AS NOTED
DRAWING FILE	POLPIS HARBOR.dwg
DATE	05/19/2023
DRAWN BY	ASC
CHECKED BY	

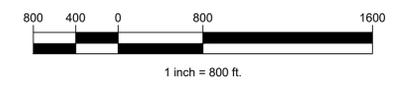
Coastal Engineering Co., Inc. © 2021
V-102
2 OF 3 SHEETS
PROJECT NO. C23048.01



MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM OF 1983 ISLAND ZONE (NAD83) (MYCS2) EPOCH 2010.00
 NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) BY RTK GPS OBSERVATIONS ON MAY 2 AND MAY 3, 2023 USING THE HXGN SMARTNET RTK NETWORK

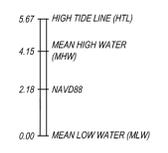


A UPPER HARBOR BATHYMETRY - PLAN
 V-103 SCALE: 1" = 800'-0"



NOTES:

1. THIS PLAN IS REFERENCED HORIZONTALLY TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM NORTH AMERICAN DATUM OF 1983, ISLAND ZONE (NAD83) (MYCS2) EPOCH 2010.00. VERTICAL DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) BY RTK GPS OBSERVATIONS ON MAY 2 AND MAY 3, 2023 USING THE HXGN SMARTNET RTK NETWORK.
2. THIS PLAN IS THE RESULT OF A BATHYMETRIC SURVEY PERFORMED ON MAY 3, 2023. THE BATHYMETRY WAS PERFORMED WITH AN ECHOTRAC E20 SINGLE BEAM ECHOSOUNDER UTILIZING HYPACK 2022 SOFTWARE.
3. SOUNDINGS SHOWN ARE SPACED APPROXIMATELY 200 FEET APART AND ARE SHOWN ONLY FOR A VISUAL REPRESENTATION OF THE MUDLINE.
4. ACTUAL LOCATION OF SOUNDING IS LOCATED ON THE DECIMAL OF THE DEPTH.
5. EXISTING UTILITIES, UNDERGROUND AND OVERHEAD, MAY EXIST IN ADDITION TO THE UTILITY INFORMATION SHOWN ON THESE PLANS. THIS PLAN MUST NOT BE USED TO LOCATE UNDERGROUND UTILITIES. CALL DIG SAFE AT 811 PRIOR TO STARTING ANY EXCAVATION.
6. SURVEY SHOWN CAN ONLY REFLECT CONDITIONS AT THE TIME OF THE SURVEY.



NOAA TIDAL PROFILE
 STA. 8447355
 MONUMENT BEACH
 SCALE: 1" = 4'

HTL REF: BUZZARDS BAY
 NATIONAL ESTUARY PROGRAM



260 Cranberry Hwy, Orleans, MA 02653
 508.255.6511 F 508.255.6700 F

NO.	DATE	REVISION	BY
1			MJB

SEAL
DRAFT

PROJECT: **ARCADIS HARBOR DREDGE STUDY** NANTUCKET, MA
 SHEET TITLE: **UPPER HARBOR EXISTING BATHYMETRY**

SCALE:	AS NOTED
DRAWING FILE:	UPPER HARBOR.dwg
DATE:	05/19/2023
DRAWN BY:	ASC
CHECKED BY:	

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V-103
 3 OF 3 SHEETS
 PROJECT NO. C23048.01

APPENDIX B CORE LOGS





LITHOLOGIC BOREHOLE LOG

260 Cranberry Hwy, Orleans, MA 02653

508.255.6511 Fax: 508.255.6700

Job #: C23048 Job Name: Nantucket Harbors Sediment Transport Study

Core Sample #: MH-1 Sample Date: 5/13/23 @11:25am

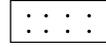
Witness Initials: MGE

Drilling Contractor: CEC

Sampling Method: Vibratory Core Sampler

Seafloor Depth:

Sheet: 1 of 12



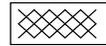
Sand



Gravel



Silty Sand



Peat



Clay



Vibratory Core Sampling Log

Elevation	Sample Depth	Sample Picture	Percent of Recovery	Descriptions of Lithology and Remarks	Sediment Samples	
-4.10 NAVD88						
0-12"	-		100%	Loose organic muck		
-5.10' NAVD88	-1'					
12-19"	-		100%	Loose/Medium loose organic muck		
-5.68 NAVD88	-					
19-28"	-2'		100%	Firm organic silt, peaty		
-6.43 NAVD88	-					
28-30", -6.6 NAVD88	-		100%	fine sand with organics		
30-34", -6.94 NAVD88	-	100%	organic fibrous, dead sea grass roots			
34-36", -7.10 NAVD88	-3'	100%	Coarse sand with gravel			
	-			<p>Taken approximately 20' east of target location</p> <p>Hard and soft bottom differ by 1.8'</p> <p>Tied up to someones float to take sample</p> <p>Taken within the limits of the marina and taken outside of the channel due to boat traffic</p>		
	-4'					
	-					
	-					
	-5'					



LITHOLOGIC BOREHOLE LOG

260 Cranberry Hwy, Orleans, MA 02653

508.255.6511 Fax: 508.255.6700

Job #: C23048 Job Name Nantucket Harbors Sediment Transport Study

Core Sample #: MH-2 Sample D 5/13/23 @10:30am

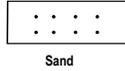
Witness Initials: MGE

Drilling Contractor: CEC

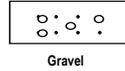
Sampling Method: Vibratory Core Sampler

Seafloor Depth:

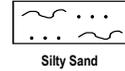
Sheet: 2 of 12



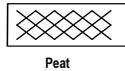
Sand



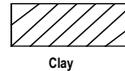
Gravel



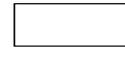
Silty Sand



Peat



Clay



Vibratory Core Sampling Log

Elevation	Sample Depth	Sample Picture	Percent of Recovery	Descriptions of Lithology and Remarks	Sediment Samples
-8.44 NAVD88					
	-			Did not get a good core sample, just a bag of dirty water with fines	
	-				
	-				
	-1'				
	-				
	-			Tube and hammer sank into mud under weight of hammer General condition of mudline was loose muck/fines	
	-				
	-4'				
	-				
	-				
	-5'				
	-				



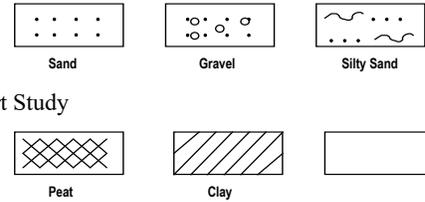


LITHOLOGIC BOREHOLE LOG

260 Cranberry Hwy, Orleans, MA 02653

508.255.6511 Fax: 508.255.6700

Job #: C23048 Job Name: Nantucket Harbors Sediment Transport Study
 Core Sample #: MH-3 Sample Date: 5/13/23 @ 9:45am
 Witness Initials: MGE
 Drilling Contractor: CEC
 Sampling Method: Vibratory Core Sampler
 Seafloor Depth:
 Sheet: 3 of 12



Vibratory Core Sampling Log

Elevation	Sample Depth	Sample Picture	Percent of Recovery	Descriptions of Lithology and Remarks	Sediment Samples
-7.42 NAVD88					
0-7" -8' NAVD88	- -		100%	organic loose muck with worms	
7-14" -8.58 NAVD88	-1' -		100%	Sandy silt with worms	
14-21" -9.17 NAVD88	- -		100%	Meidum coarse sand with fines	
	-2' - - - - -3' - - - -4' - - - -5' -			<p>Taken approximately 12' southeast of target location Similar to MH-1, and MH-2 the mudline was soft and consisted of loose muck</p>	

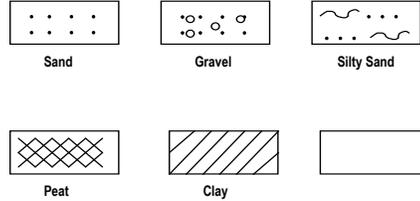


LITHOLOGIC BOREHOLE LOG

260 Cranberry Hwy, Orleans, MA 02653

508.255.6511 Fax: 508.255.6700

Job #: C23048 Job Name: Nantucket Harbors Sediment Transport Study
 Core Sample #: MH-4 Sample Date: 5/13/23 @4:45am
 Witness Initials: MGE
 Drilling Contractor: CEC
 Sampling Method: Vibratory Core Sampler
 Seafloor Depth:
 Sheet: 4 of 12



Vibratory Core Sampling Log					
Elevation	Sample Depth	Sample Picture	Percent of Recovery	Descriptions of Lithology and Remarks	Sediment Samples
-4.74 NAVD88					
0-5"	-		100%	Light brown Medium-Fine sand with grey organics	
-5.16 NAVD88	-		100%	Medium-fine sand with 0.75" pebbles	
5-14"	-				
-5.91 NAVD88	-1'		100%	Shells and Ocean plastic Fine sand with organics	
14-21"	-				
-6.49 NAVD88	-	100%	Sand with Gravel		
21-33"	-2'				
-7.49 NAVD88	-				
	-				
	-3'				
	-				
	-				
	-				
	-				
	-				
	-4'				
	-				
	-				
	-				
	-				
	-5'				
	-				

Taken approximately 18' west of target location
 The area to the north of the channel leaving Madaket Harbor has eelgrass beds.
 The sample was taken at the chosen location due to water depths in the channel and to avoid blocking the channel.



LITHOLOGIC BOREHOLE LOG

260 Cranberry Hwy, Orleans, MA 02653

508.255.6511 Fax: 508.255.6700

Job #: C23048 Job Name: Nantucket Harbors Sediment Transport Study

Core Sample #: MH-5 Sample Date: 5/13/23 @4:00pm

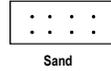
Witness Initials: MGE

Drilling Contractor: CEC

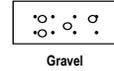
Sampling Method: Vibratory Core Sampler

Seafloor Depth:

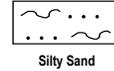
Sheet: 5 of 12



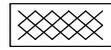
Sand



Gravel



Silty Sand



Peat



Clay



Vibratory Core Sampling Log

Elevation	Sample Depth	Sample Picture	Percent of Recovery	Descriptions of Lithology and Remarks	Sediment Samples	
-6.78NAVD88						
0-4"	-		100%	Silt with trace sand		
-7.11 NAVD88	-					
4-9"	-		100%	Silty sand		
-7.53 NAVD88	-					
9-15"	-1'		100%	Coarse sand with gravel and shells		
-8.03 NAVD88	-					
15-19"	-	100%	Medium fine sand			
-8.36 NAVD88	-					
	-			Taken approximately 23' south of target location		
	-2'			<p>This sample was taken in the location due to how the anchors were set up and the draft due to current wind. Area surrounding this test location was full of ell grass beds with isolated sandy patches mixed in.</p>		
	-					
	-					
	-					
	-					
	-3'					
	-					
	-					
	-					
	-4'					
	-					
	-					
	-5'					
	-					



LITHOLOGIC BOREHOLE LOG

260 Cranberry Hwy, Orleans, MA 02653

508.255.6511 Fax: 508.255.6700

Job #: C23048 Job Name: Nantucket Harbors Sediment Transport Study

Core Sample #: MH-6 Sample Date: 5/13/23 @2:30pm

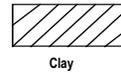
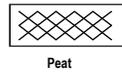
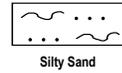
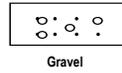
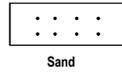
Witness Initials: MGE

Drilling Contractor: CEC

Sampling Method: Vibratory Core Sampler

Seafloor Depth:

Sheet: 6 of 12



Vibratory Core Sampling Log

Elevation	Sample Depth	Sample Picture	Percent of Recovery	Descriptions of Lithology and Remarks	Sediment Samples
-6.16' NAVD88					
0-14"	-		100%	Silty sand - fine sand with silt and organics	
-7.33 NAVD88	-1'				
14-27"	-		100%	Organics, worms and shells, fine to medium sand	
-8.41 NAVD88	-2'				
27-30"	-		100%	Medium coarse sand	
-8.66 NAVD88	-			<p>Taken approximately 11' east of target location Location chosen due to anchor location and drift Areas surrounding the sample location has eel grass beds</p>	
	-3'				
	-				
	-				
	-4'				
	-				
	-				
	-5'				
	-				
	-				

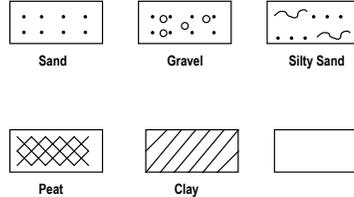


LITHOLOGIC BOREHOLE LOG

260 Cranberry Hwy, Orleans, MA 02653

508.255.6511 Fax: 508.255.6700

Job #: C23048 Job Name: Nantucket Harbors Sediment Transport Study
 Core Sample #: MH-7 Sample Date: 5/13/23 @1:10pm
 Witness Initials: MGE
 Drilling Contractor: CEC
 Sampling Method: Vibratory Core Sampler
 Seafloor Depth:
 Sheet: 7 of 12



Vibratory Core Sampling Log					
Elevation	Sample Depth	Sample Picture	Percent of Recovery	Descriptions of Lithology and Remarks	Sediment Samples
-4.52NAVD88					
0-6"	-		100%	Quahog at 1"	
-5.02 NAVD88	-		100%	Sandy sily, Organics	
6-17"	-		100%	Coarse Sand with Gravel	
-5.94 NAVD88	-1'		100%	Loose medium coarse sand with fines	
17-19"	-				
-6.10 NAVD88	-2'			<p>Taken approximately 160' southwest of target location Sample location chosen due to water depth and anchor locations, anchors where set to not block the narrow channel at the point, and to not get to shallow with the boat.</p> <p>Tide shifted during setup and moved us further from sample location</p>	
	-				
	-				
	-3'				
	-				
	-				
	-				
	-4'				
	-				
	-				



LITHOLOGIC BOREHOLE LOG

260 Cranberry Hwy, Orleans, MA 02653

508.255.6511 Fax: 508.255.6700

Job #: C23048 Job Name: Nantucket Harbors Sediment Transport Study

Core Sample #: UH-2 Sample Date: 5/14/23 @9:56am

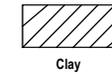
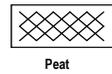
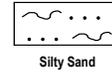
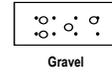
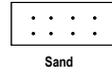
Witness Initials: MGE

Drilling Contractor: CEC

Sampling Method: Vibratory Core Sampler

Seafloor Depth:

Sheet: 9 of 12



Vibratory Core Sampling Log

Elevation	Sample Depth	Sample Picture	Percent of Recovery	Descriptions of Lithology and Remarks	Sediment Samples
-4.92NAVD88					
0-18"	- - - -1'		100%	Coarse Sand	
-6.42 NAVD88	- -				
18-27"	- - -2'		100%	Coarse Sand + Dark Grey Organics	
-7.17 NAVD88	- - -3' - - -4' - - - -			<p>Taken approximately 830' west of target location due to water depth. We aimed for the sandbar sticking out from the north</p> <p>Mudline was exclusively sand with no visible structures or eelgrass beds within the area of the sample.</p>	

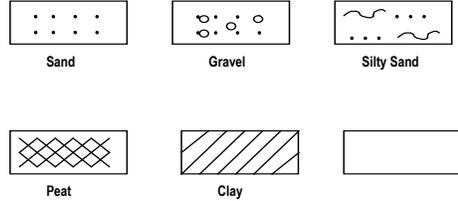


LITHOLOGIC BOREHOLE LOG

260 Cranberry Hwy, Orleans, MA 02653

508.255.6511 Fax: 508.255.6700

Job #: C23048 Job Name: Nantucket Harbors Sediment Transport Study
 Core Sample #: PH-3 Sample Date: 5/14/23 @7:42am
 Witness Initials: MGE
 Drilling Contractor: CEC
 Sampling Method: Vibratory Core Sampler
 Seafloor Depth:
 Sheet: 12 of 12



Vibratory Core Sampling Log

Elevation	Sample Depth	Sample Picture	Percent of Recovery	Descriptions of Lithology and Remarks	Sediment Samples
-5.20NAVD88					
0-3", -5.45 NAVD88	-		100%	Medium-Coarse sand deposit	
3-9"	-		100%	Grey	
-5.95 NAVD88	-		100%	Medium-Coarse sand with organics	
9-15"	-1'		100%	Medium-Coarse sand	
-6.45 NAVD88	-				
	-				
	-				
	-2'				
	-				
	-				
	-				
	-3'				
	-				
	-				
	-				
	-4'				
	-				
	-				
	-				
	-5'				
	-				
	-				

Taken approximately 55' southwest of target locaton

APPENDIX C
CORE SAMPLES - SIEVE ANALYSIS





SIEVE ANALYSIS RECORD SHEET

Project No: C23048.01

260 Cranberry Hwy., Orleans, MA 02853 508-255-6511 Fax: 508-255-6700

Client: Arcadis / Nantucket Harbors Sediment Transport

Date: 06/20/23/2023 Time: 3 hours each

Pre-Sieve Measurements:

SAMPLE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Pan ID	SP-1	SP-1	SP-7	SP-1	SP-2	SP-3	SP-4	SP-5	SP-6	SP-5	SP-1	SP-5	SP-3	SP-7	SP-6
Pan wt. (g)	296.50	296.5	283.5	296.5	280.8	169.5	172.1	197.4	193.4	197.4	296.5	197.9	170.1	283.9	193.4
Pan + Moist Sample (g)	554.10	553.0	557.5	555.7	555.2	556.5	555.9	556.2	549.3	555.0	555.3	570.8	578.6	557.9	555.6
Pan + Dry Sample (g)	380.20	481.1	518.1	536.8	507.2	502.0	527.3	517.5	538.7	538.0	516.2	549.7	548.9	550.8	544.1
Moisture Content (g)	173.90	71.9	39.4	18.9	48.0	54.5	28.6	38.7	10.6	17.0	39.1	21.1	29.7	7.1	11.5
% Moisture by weight	67.5	28.0	14.4	7.3	17.5	14.1	7.5	10.8	3.0	4.8	15.1	5.7	7.3	2.6	3.2

Oven:

Time in: _____

Time out: _____

Each sample remained in oven for 3 hours

Weight Retained + Pan (g):

Sieve No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0.88	296.5	296.5	283.5	308.0	286.1	169.5	172.1	197.4	193.4	206.7	301.8	197.9	170.1	283.9	193.4
4	303.80	299.4	287.3	305.5	290.0	171.0	183.3	200.3	194.0	217.3	301.6	197.9	170.3	283.9	198.6
10	321.00	307.4	302.4	314.0	297.9	181.9	206.1	210.0	199.5	217.6	307.5	199.4	177.5	287.9	225.4
20	308.80	321.0	352.1	342.3	330.3	227.8	273.9	238.4	239.7	269.5	400.2	229.0	218.4	317.9	286.1
40	304.20	347.5	360.8	370.8	350.9	277.5	312.3	304.6	324.9	294.9	380.9	322.4	276.0	374.9	340.1
60	308.00	345.4	321.3	355.4	332.7	231.9	220.7	275.5	282.5	219.7	304.4	285.2	239.9	355.0	243.3
100	306.20	318.9	298.0	312.4	299.5	199.5	182.0	222.1	237.5	237.3	297.4	224.4	206.1	322.7	203.5
140	300.70	306.3	289.0	299.5	286.4	192.5	174.7	215.3	204.0	230.1	297.3	288.2	230.5	296.7	197.9
200	299.00	301.8	286.0	297.4	279.7	183.9	174.1	208.9	199.3	208.9	296.6	205.1	188.2	289.5	196.1
PAN	300.40	304.9	288.8	299.1	280.4	191.5	176.4	220.3	204.3	210.7	296.9	210.4	200.2	292.4	199.0

Sample Correspondence:

SAMPLE	DESCRIPTION
1	MH-1 (16-27")
2	MH-3 (7-14")
3	MH-3 (14-21")
4	MH-4 (5-14")
5	MH-4 (21-33")
6	MH-5 (0-9")
7	MH-5 (9-19")
8	MH-6 (0-14")
9	MH-6 (14-26")
10	MH-7 (0-6")
11	MH-7 (6-17")
12	MH-6 (0-14") RETEST
13	MH-5 (0-9") RETEST
14	MH-6 (14-26") RETEST
15	MH-5 (9-19") RETEST

Sampled by: Coastal Engineering

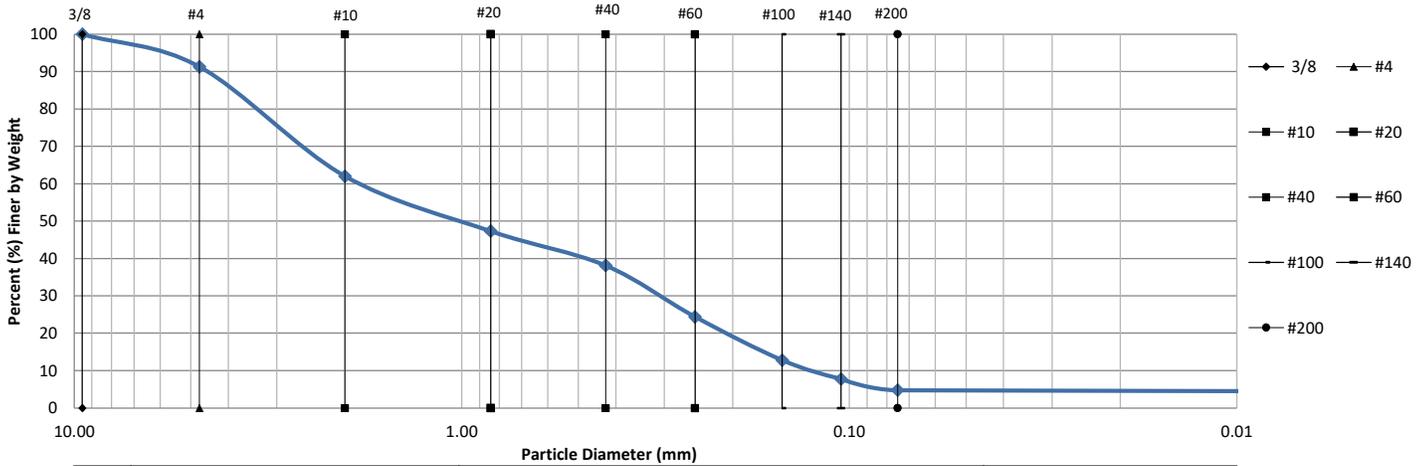
Analysis by: ACC



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 1					
DATE: 06/20-23/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 83.7			SOURCE OF SAMPLE: MH-1 (16-27")					
PAN WEIGHT (grams): 296.5			SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC			
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	7.3	7.3	8.72	8.72	91.28	
0.08	2.000	10	24.5	31.8	29.27	37.99	62.01	
0.03	0.841	20	12.3	44.1	14.70	52.69	47.31	
0.02	0.425	40	7.7	51.8	9.20	61.89	38.11	
0.01	0.250	60	11.5	63.3	13.74	75.63	24.37	
0.01	0.149	100	9.7	73.0	11.59	87.22	12.78	
0.00	0.105	140	4.2	77.2	5.02	92.23	7.77	
0.00	0.075	200	2.5	79.7	2.99	95.22	4.78	
0.00	0.000	Pan	3.9	83.6	4.66	99.88	0.12	
Passed Mesh Sieve								
TOTAL			83.6					



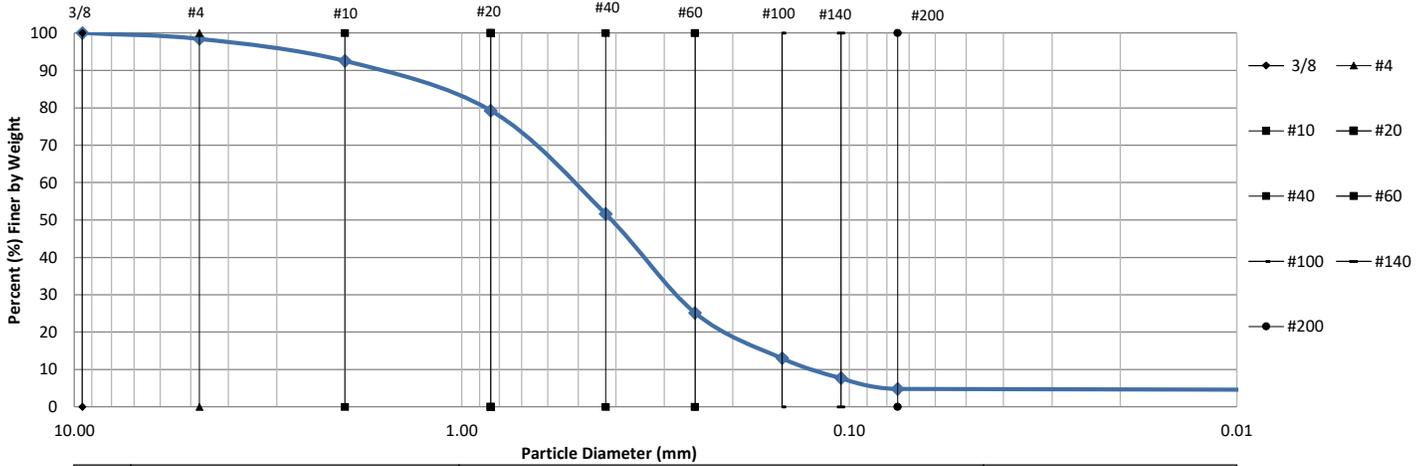
CBL	GRAVEL	SAND			SILT OR CLAY
		CRS	MEDIUM	FINE	



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 2					
DATE: 06/20-23/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XYYX X/X					
DRY WEIGHT OF SAMPLE (grams): 184.6			SOURCE OF SAMPLE: MH-3 (7-14")					
PAN WEIGHT (grams): 296.5			SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC			
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	2.9	2.9	1.57	1.57	98.43	
0.08	2.000	10	10.9	13.8	5.90	7.48	92.52	
0.03	0.841	20	24.5	38.3	13.27	20.75	79.25	
0.02	0.425	40	51.0	89.3	27.63	48.37	51.63	
0.01	0.250	60	48.9	138.2	26.49	74.86	25.14	
0.01	0.149	100	22.4	160.6	12.13	87.00	13.00	
0.00	0.105	140	9.8	170.4	5.31	92.31	7.69	
0.00	0.075	200	5.3	175.7	2.87	95.18	4.82	
0.00	0.000	Pan	8.4	184.1	4.55	99.73	0.27	
Passed Mesh Sieve								
TOTAL			184.1					



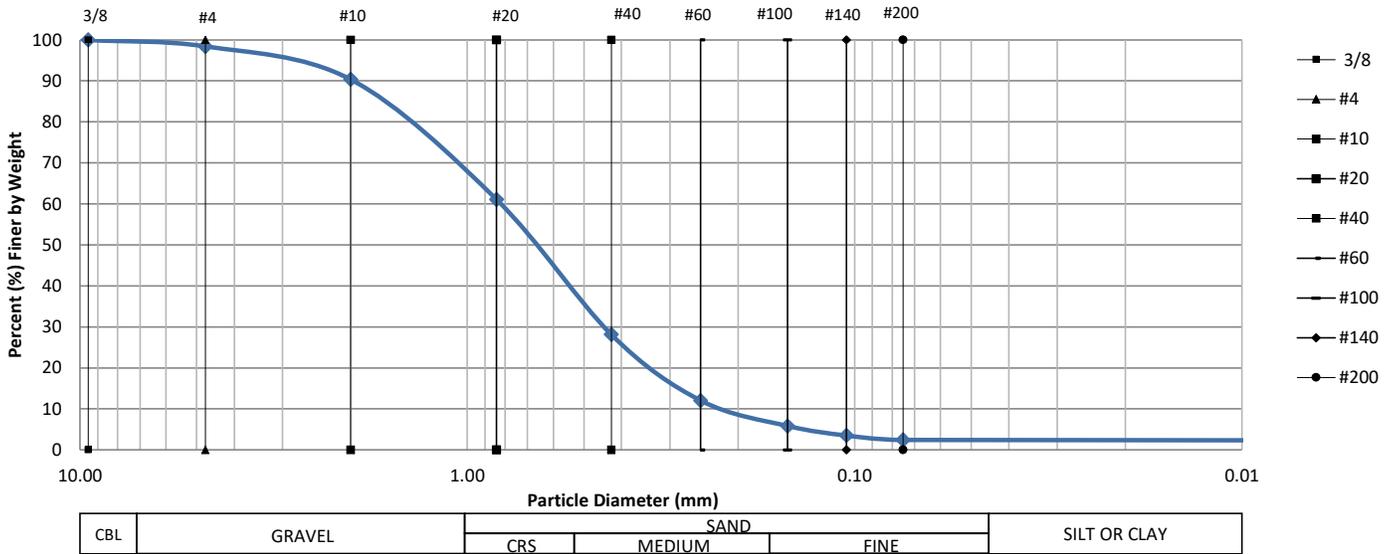
CBL	GRAVEL	SAND			SILT OR CLAY
		CRS	MEDIUM	FINE	



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 3				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XXYX X/X				
DRY WEIGHT OF SAMPLE (grams): 234.6				SOURCE OF SAMPLE: MH-3 (14-21")				
PAN WEIGHT (grams): 283.5				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	3.8	3.8	1.62	1.62	98.38	
0.08	2.000	10	18.9	22.7	8.06	9.68	90.32	
0.03	0.841	20	68.6	91.3	29.24	38.92	61.08	
0.02	0.425	40	77.3	168.6	32.95	71.87	28.13	
0.01	0.250	60	37.8	206.4	16.11	87.98	12.02	
0.01	0.149	100	14.5	220.9	6.18	94.16	5.84	
0.00	0.105	140	5.5	226.4	2.34	96.50	3.50	
0.00	0.075	200	2.5	228.9	1.07	97.57	2.43	
0.00	0.000	Pan	5.3	234.2	2.26	99.83	0.17	
Passed Mesh Sieve								
TOTAL			234.2					

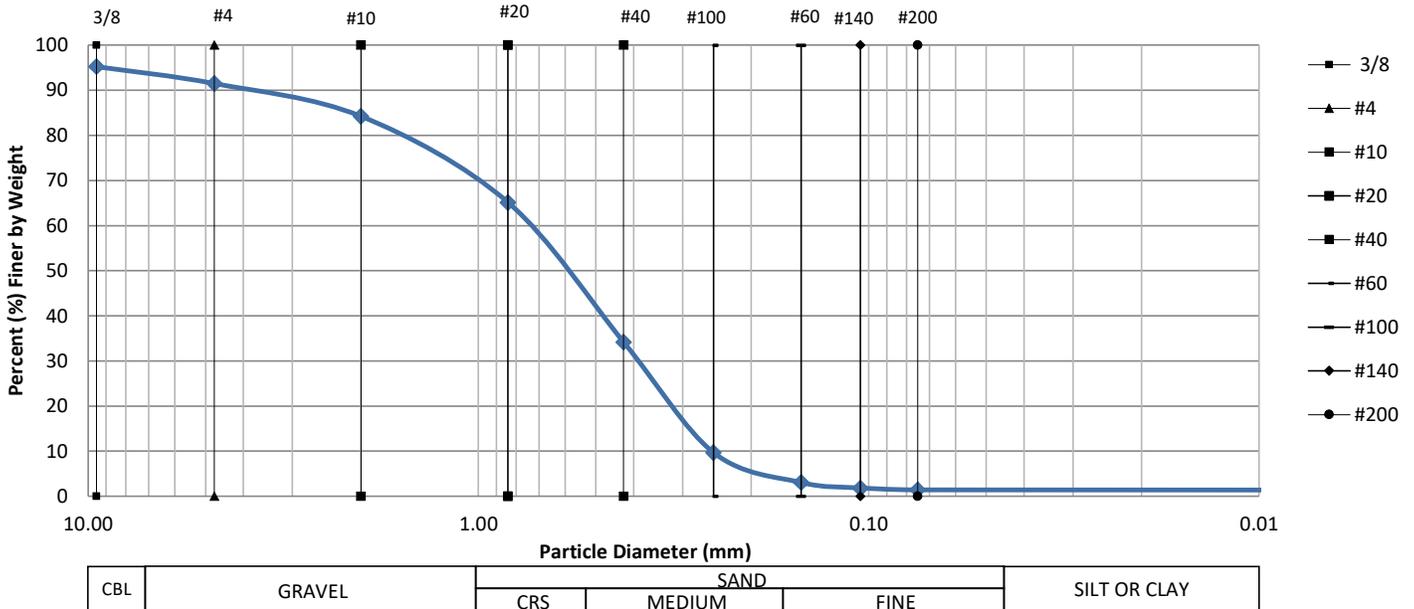




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 4				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XXYX X/X				
DRY WEIGHT OF SAMPLE (grams): 240.3				SOURCE OF SAMPLE: MH-4 (5-14")				
PAN WEIGHT (grams): 296.5				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	11.5	11.5	4.79	4.79	95.21	
0.19	4.750	4	9.0	20.5	3.75	8.53	91.47	
0.08	2.000	10	17.5	38.0	7.28	15.81	84.19	
0.03	0.841	20	45.8	83.8	19.06	34.87	65.13	
0.02	0.425	40	74.3	158.1	30.92	65.79	34.21	
0.01	0.250	60	58.9	217.0	24.51	90.30	9.70	
0.01	0.149	100	15.9	232.9	6.62	96.92	3.08	
0.00	0.105	140	3.0	235.9	1.25	98.17	1.83	
0.00	0.075	200	0.9	236.8	0.37	98.54	1.46	
0.00	0.000	Pan	2.6	239.4	1.08	99.63	0.37	
Passed Mesh Sieve								
TOTAL			239.4					

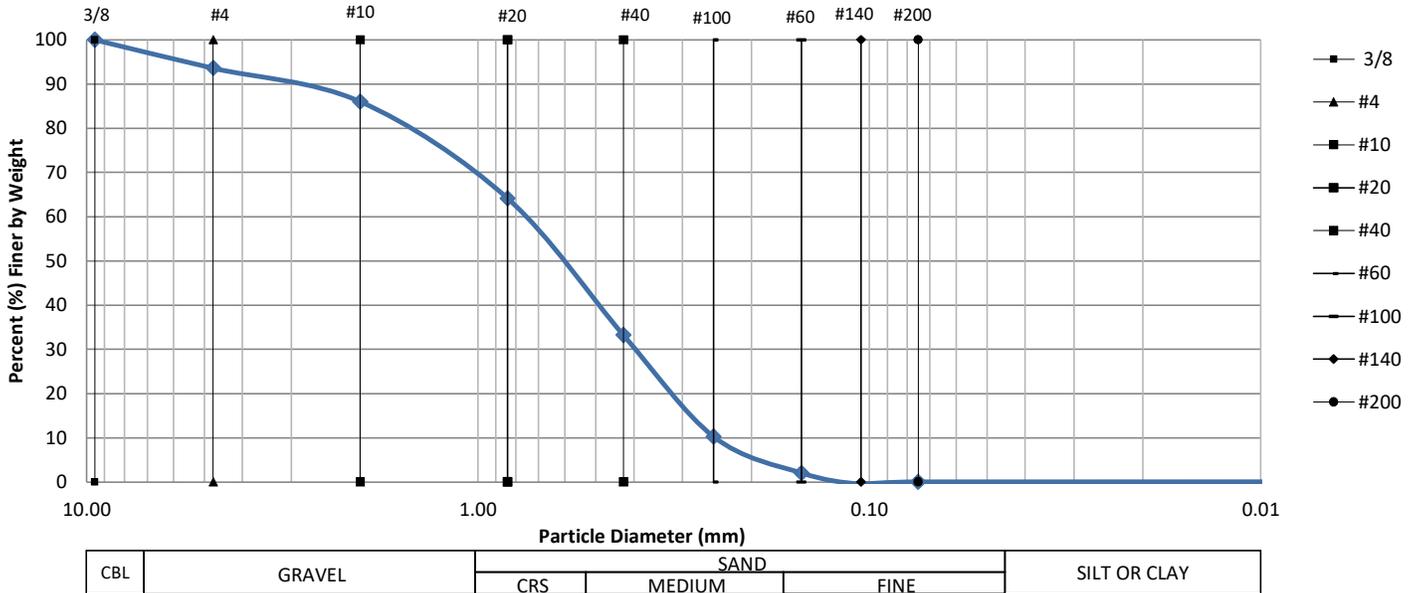




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 5				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYYX X/X				
DRY WEIGHT OF SAMPLE (grams): 226.4				SOURCE OF SAMPLE: MH-4 (21-33")				
PAN WEIGHT (grams): 280.8				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	5.3	5.3	2.34	0.00	100.00	
0.19	4.750	4	9.2	14.5	4.06	6.40	93.60	
0.08	2.000	10	17.1	31.6	7.55	13.96	86.04	
0.03	0.841	20	49.5	81.1	21.86	35.82	64.18	
0.02	0.425	40	70.1	151.2	30.96	66.78	33.22	
0.01	0.250	60	51.9	203.1	22.92	89.71	10.29	
0.01	0.149	100	18.7	221.8	8.26	97.97	2.03	
0.00	0.105	140	5.6	227.4	2.47	100.44	-0.44	
0.00	0.075	200	-1.1	226.3	-0.49	99.96	0.04	
0.00	0.000	Pan	-0.4	225.9	-0.18	99.78	0.22	
Passed Mesh Sieve								
TOTAL				225.9				

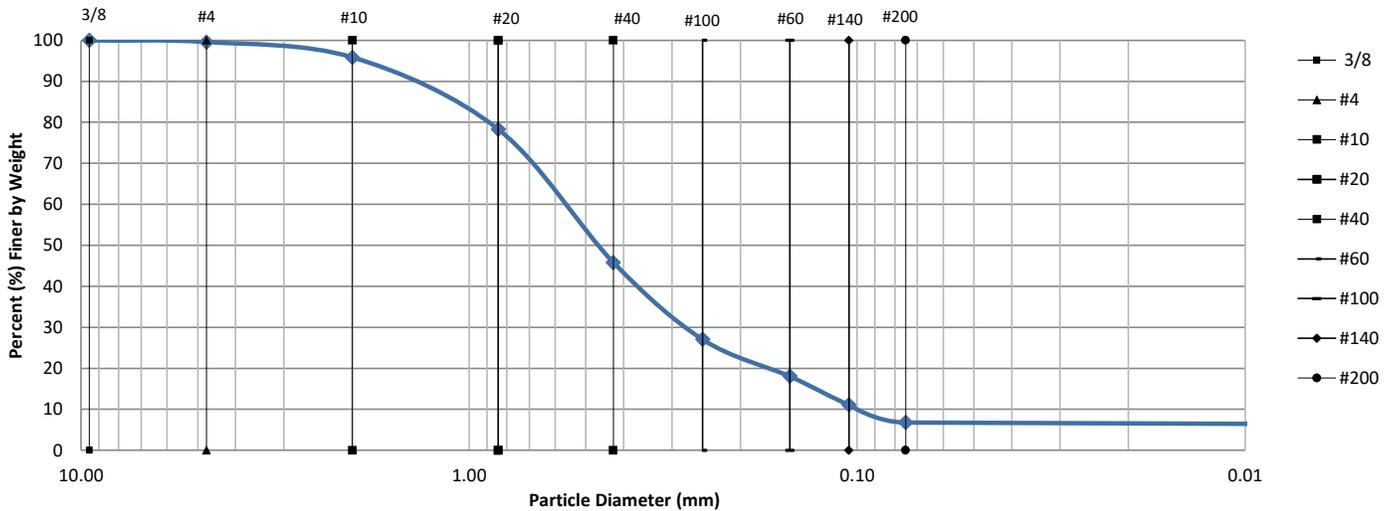




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 6				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYY X/X				
DRY WEIGHT OF SAMPLE (grams): 332.5				SOURCE OF SAMPLE: MH-5 (0-9")				
PAN WEIGHT (grams): 169.5				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	1.5	1.5	0.45	0.45	99.55	
0.08	2.000	10	12.4	13.9	3.73	4.18	95.82	
0.03	0.841	20	58.3	72.2	17.53	21.71	78.29	
0.02	0.425	40	108.0	180.2	32.48	54.20	45.80	
0.01	0.250	60	62.4	242.6	18.77	72.96	27.04	
0.01	0.149	100	30.0	272.6	9.02	81.98	18.02	
0.00	0.105	140	23.0	295.6	6.92	88.90	11.10	
0.00	0.075	200	14.4	310.0	4.33	93.23	6.77	
0.00	0.000	Pan	22.0	332.0	6.62	99.85	0.15	
Passed Mesh Sieve								
TOTAL				332.0				



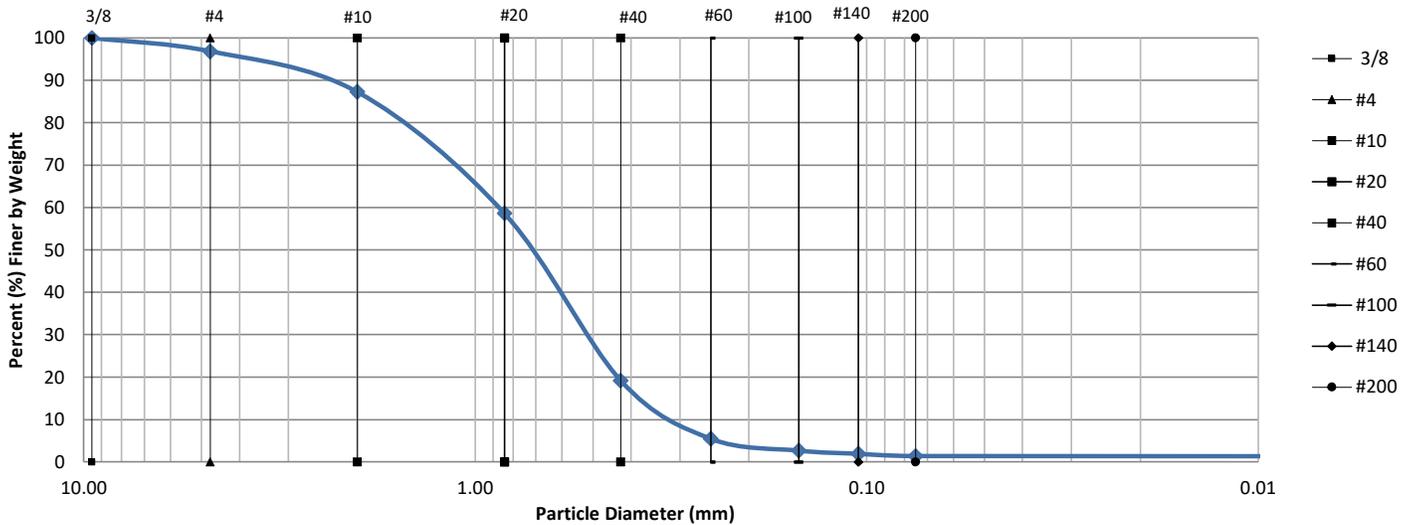
CBL	GRAVEL	SAND			SILT OR CLAY
		CRS	MEDIUM	FINE	



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 7				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XXYY X/X				
DRY WEIGHT OF SAMPLE (grams): 355.2				SOURCE OF SAMPLE: MH-5 (9-19")				
PAN WEIGHT (grams): 172.1				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	11.2	11.2	3.15	3.15	96.85	
0.08	2.000	10	34.0	45.2	9.57	12.73	87.27	
0.03	0.841	20	101.8	147.0	28.66	41.39	58.61	
0.02	0.425	40	140.2	287.2	39.47	80.86	19.14	
0.01	0.250	60	48.6	335.8	13.68	94.54	5.46	
0.01	0.149	100	9.9	345.7	2.79	97.33	2.67	
0.00	0.105	140	2.6	348.3	0.73	98.06	1.94	
0.00	0.075	200	2.0	350.3	0.56	98.62	1.38	
0.00	0.000	Pan	4.3	354.6	1.21	99.83	0.17	
Passed Mesh Sieve								
TOTAL			354.6					



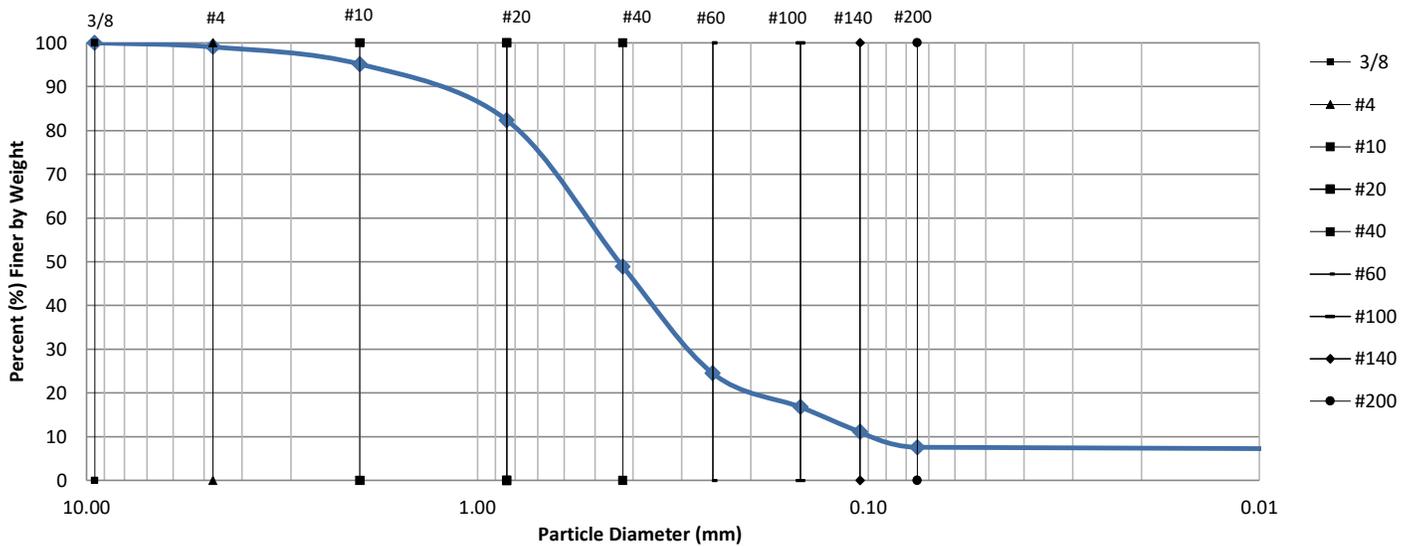
CBL	GRAVEL	SAND			SILT OR CLAY
		CRS	MEDIUM	FINE	



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 8				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XXYY X/X				
DRY WEIGHT OF SAMPLE (grams): 320.1				SOURCE OF SAMPLE: MH-6 (0-14")				
PAN WEIGHT (grams): 197.4				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	2.9	2.9	0.91	0.91	99.09	
0.08	2.000	10	12.6	15.5	3.94	4.84	95.16	
0.03	0.841	20	41.0	56.5	12.81	17.65	82.35	
0.02	0.425	40	107.2	163.7	33.49	51.14	48.86	
0.01	0.250	60	78.1	241.8	24.40	75.54	24.46	
0.01	0.149	100	24.7	266.5	7.72	83.26	16.74	
0.00	0.105	140	17.9	284.4	5.59	88.85	11.15	
0.00	0.075	200	11.5	295.9	3.59	92.44	7.56	
0.00	0.000	Pan	22.9	318.8	7.15	99.59	0.41	
Passed Mesh Sieve								
TOTAL			318.8					



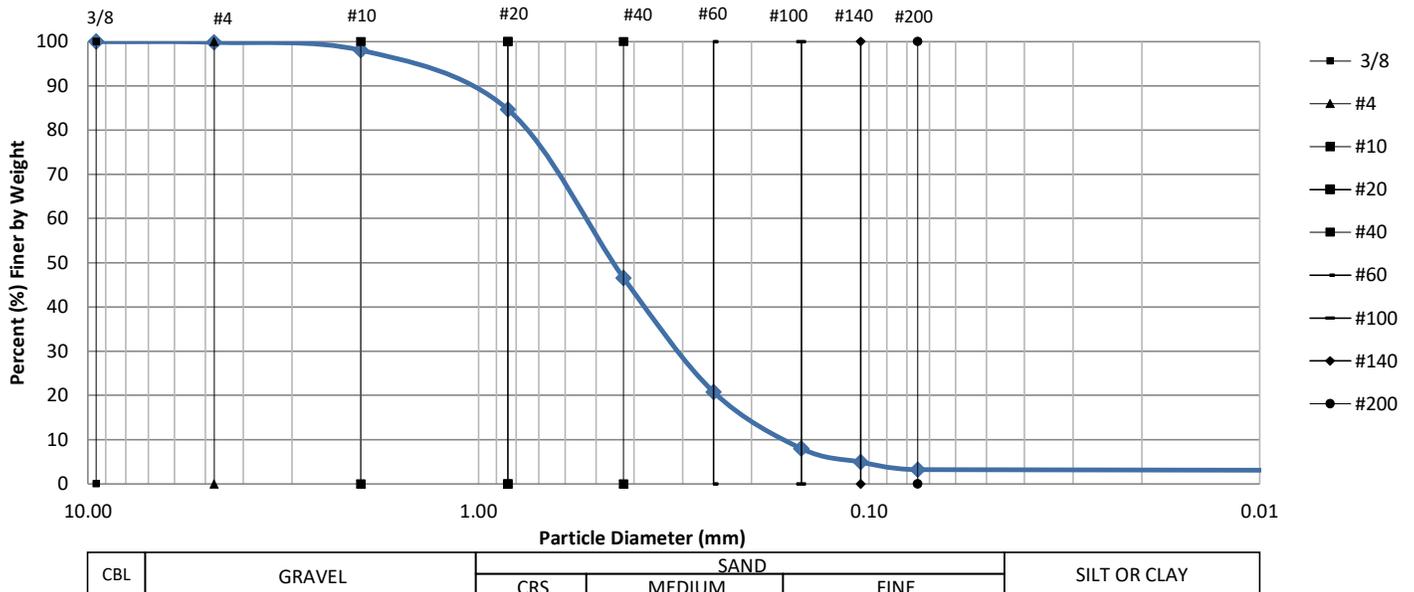
CBL	GRAVEL	SAND			SILT OR CLAY
		CRS	MEDIUM	FINE	



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 9				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYYX X/X				
DRY WEIGHT OF SAMPLE (grams): 345.3				SOURCE OF SAMPLE: MH-6 (14-26")				
PAN WEIGHT (grams): 193.4				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	0.6	0.6	0.17	0.17	99.83	
0.08	2.000	10	6.1	6.7	1.77	1.94	98.06	
0.03	0.841	20	46.3	53.0	13.41	15.35	84.65	
0.02	0.425	40	131.5	184.5	38.08	53.43	46.57	
0.01	0.250	60	89.1	273.6	25.80	79.24	20.76	
0.01	0.149	100	44.1	317.7	12.77	92.01	7.99	
0.00	0.105	140	10.6	328.3	3.07	95.08	4.92	
0.00	0.075	200	5.9	334.2	1.71	96.79	3.21	
0.00	0.000	Pan	10.9	345.1	3.16	99.94	0.06	
Passed Mesh Sieve								
TOTAL			345.1					

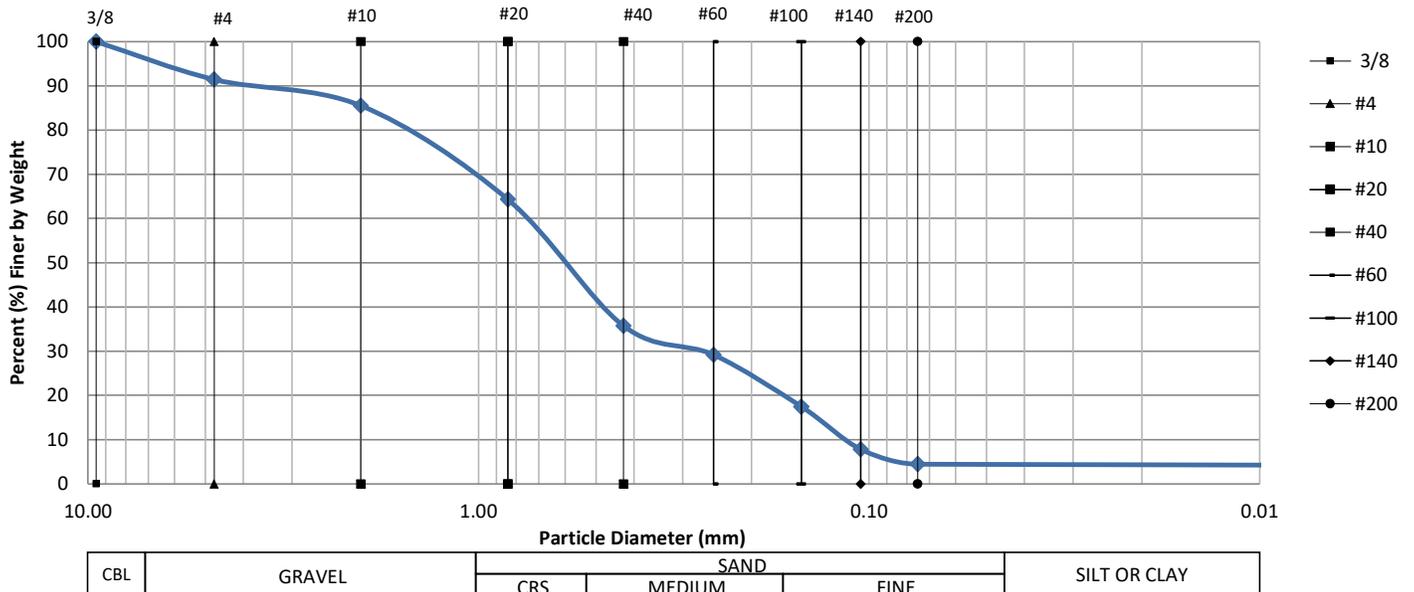




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 10				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYY X/X				
DRY WEIGHT OF SAMPLE (grams): 340.6				SOURCE OF SAMPLE: MH-7 (0-6")				
PAN WEIGHT (grams): 197.4				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	9.3	9.3	2.73	0.00	100.00	
0.19	4.750	4	19.9	29.2	5.84	8.57	91.43	
0.08	2.000	10	20.2	49.4	5.93	14.50	85.50	
0.03	0.841	20	72.1	121.5	21.17	35.67	64.33	
0.02	0.425	40	97.5	219.0	28.63	64.30	35.70	
0.01	0.250	60	22.3	241.3	6.55	70.85	29.15	
0.01	0.149	100	39.9	281.2	11.71	82.56	17.44	
0.00	0.105	140	32.7	313.9	9.60	92.16	7.84	
0.00	0.075	200	11.5	325.4	3.38	95.54	4.46	
0.00	0.000	Pan	13.3	338.7	3.90	99.44	0.56	
Passed Mesh Sieve								
TOTAL			338.7					

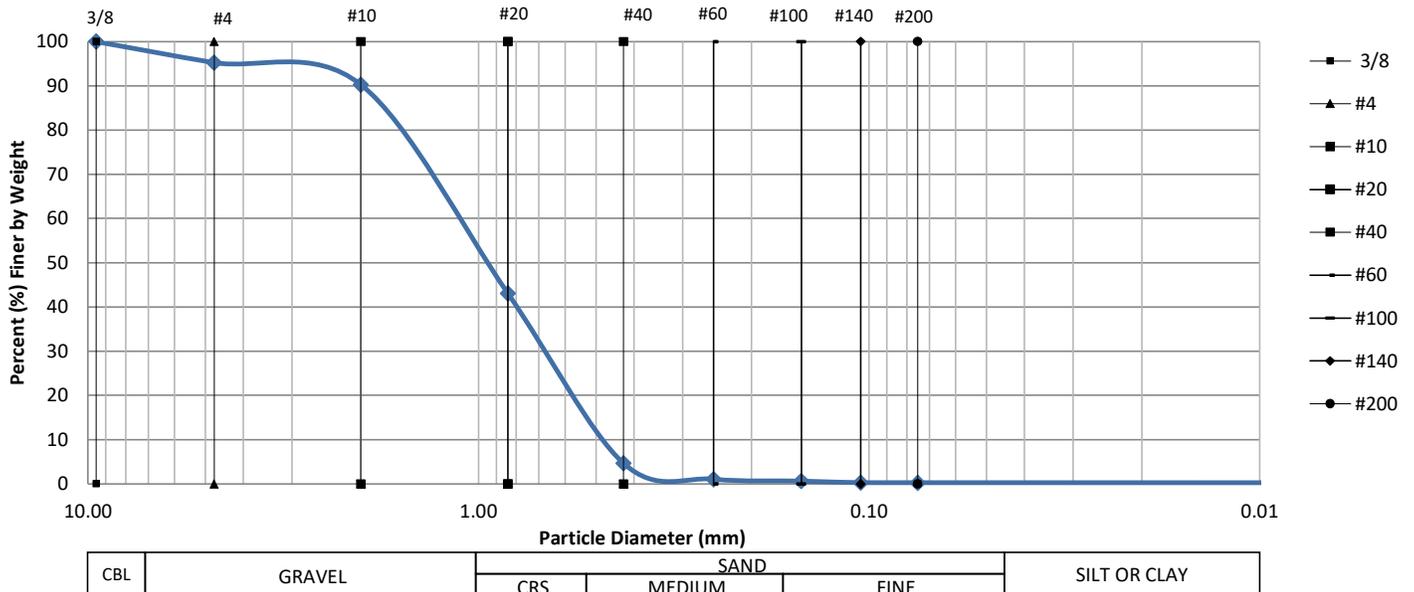




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 11				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYY X/X				
DRY WEIGHT OF SAMPLE (grams): 219.7				SOURCE OF SAMPLE: MH-7 (6-17")				
PAN WEIGHT (grams): 296.5				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	5.3	5.3	2.41	0.00	100.00	
0.19	4.750	4	5.1	10.4	2.32	4.73	95.27	
0.08	2.000	10	11.0	21.4	5.01	9.74	90.26	
0.03	0.841	20	103.7	125.1	47.20	56.94	43.06	
0.02	0.425	40	84.4	209.5	38.42	95.36	4.64	
0.01	0.250	60	7.9	217.4	3.60	98.95	1.05	
0.01	0.149	100	0.9	218.3	0.41	99.36	0.64	
0.00	0.105	140	0.8	219.1	0.36	99.73	0.27	
0.00	0.075	200	0.1	219.2	0.05	99.77	0.23	
0.00	0.000	Pan	0.4	219.6	0.18	99.95	0.05	
Passed Mesh Sieve								
TOTAL			219.6					

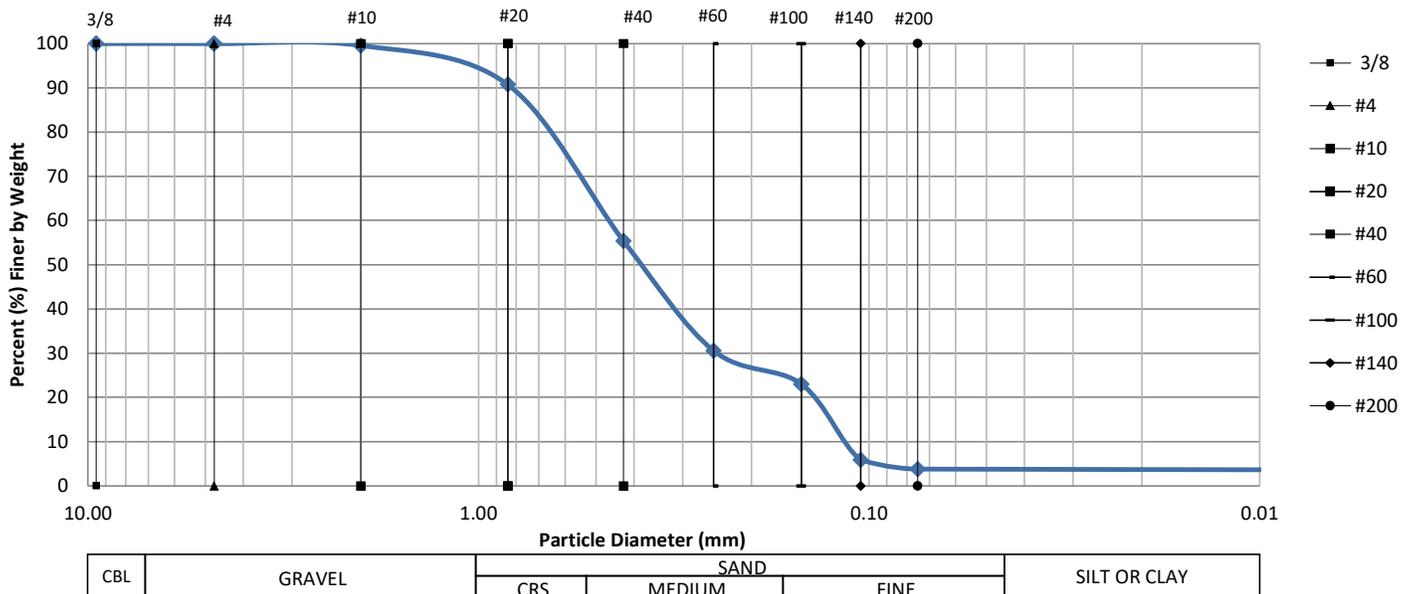




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 12				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYY X/X				
DRY WEIGHT OF SAMPLE (grams): 351.8				SOURCE OF SAMPLE: MH-6 (0-14") RETEST				
PAN WEIGHT (grams): 197.9				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	0.0	0.0	0.00	0.00	100.00	
0.08	2.000	10	1.5	1.5	0.43	0.43	99.57	
0.03	0.841	20	31.1	32.6	8.84	9.27	90.73	
0.02	0.425	40	124.5	157.1	35.39	44.66	55.34	
0.01	0.250	60	87.3	244.4	24.82	69.47	30.53	
0.01	0.149	100	26.5	270.9	7.53	77.00	23.00	
0.00	0.105	140	60.3	331.2	17.14	94.14	5.86	
0.00	0.075	200	7.2	338.4	2.05	96.19	3.81	
0.00	0.000	Pan	12.5	350.9	3.55	99.74	0.26	
Passed Mesh Sieve								
TOTAL			350.9					

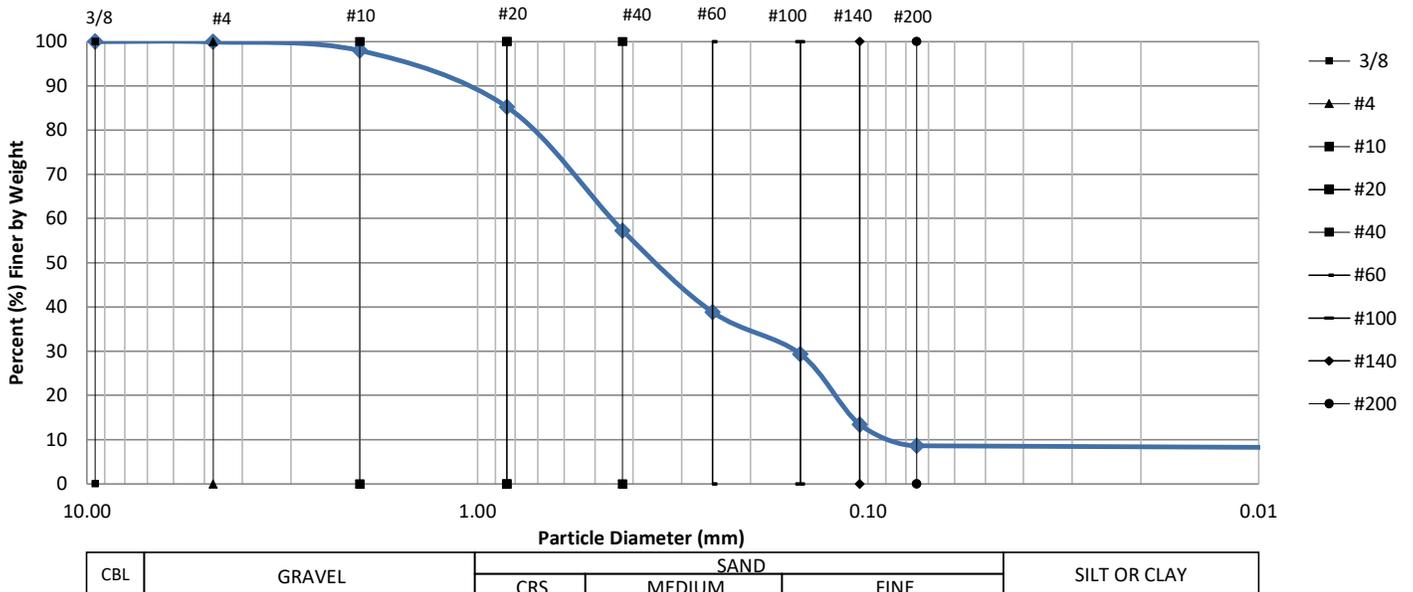




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260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 13				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYY X/X				
DRY WEIGHT OF SAMPLE (grams): 378.8				SOURCE OF SAMPLE: MH-5 (0-9") RETEST				
PAN WEIGHT (grams): 170.1				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	0.2	0.2	0.05	0.05	99.95	
0.08	2.000	10	7.4	7.6	1.95	2.01	97.99	
0.03	0.841	20	48.3	55.9	12.75	14.76	85.24	
0.02	0.425	40	105.9	161.8	27.96	42.71	57.29	
0.01	0.250	60	69.8	231.6	18.43	61.14	38.86	
0.01	0.149	100	36.0	267.6	9.50	70.64	29.36	
0.00	0.105	140	60.4	328.0	15.95	86.59	13.41	
0.00	0.075	200	18.1	346.1	4.78	91.37	8.63	
0.00	0.000	Pan	30.1	376.2	7.95	99.31	0.69	
Passed Mesh Sieve								
TOTAL			376.2					

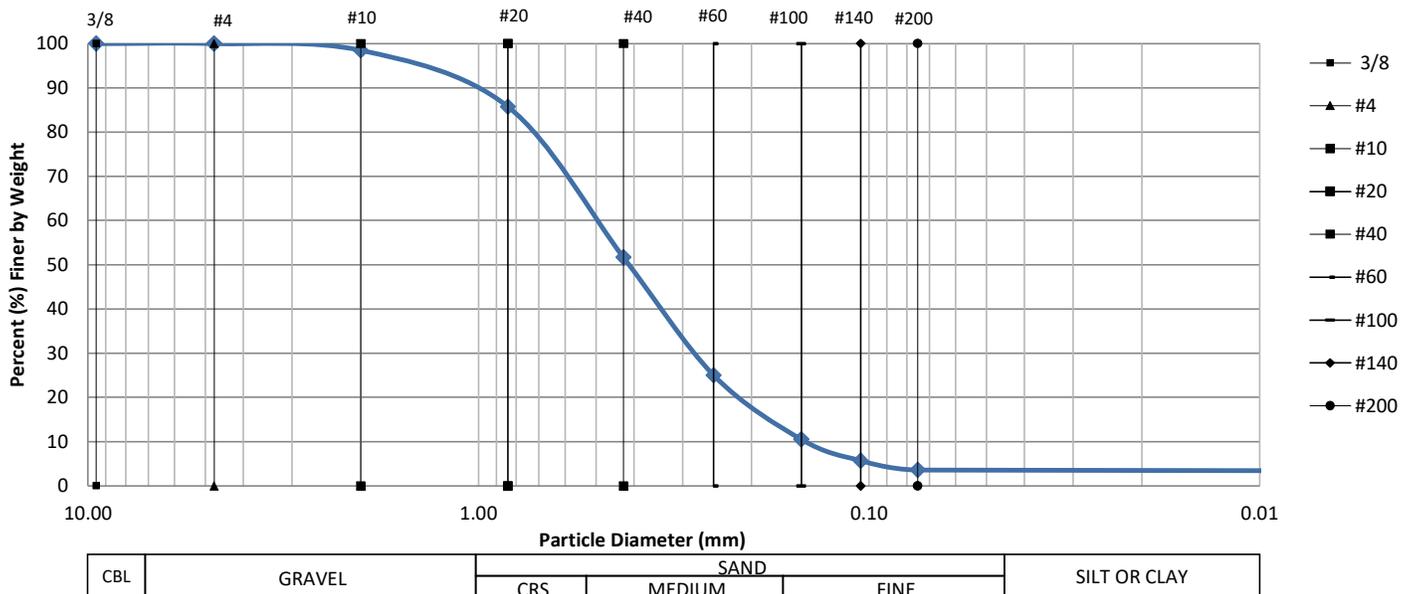




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 14				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYY X/X				
DRY WEIGHT OF SAMPLE (grams): 266.9				SOURCE OF SAMPLE: MH-6 (14-26") RETEST				
PAN WEIGHT (grams): 283.9				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	0.0	0.0	0.00	0.00	100.00	
0.08	2.000	10	4.0	4.0	1.50	1.50	98.50	
0.03	0.841	20	34.0	38.0	12.74	14.24	85.76	
0.02	0.425	40	91.0	129.0	34.10	48.33	51.67	
0.01	0.250	60	71.1	200.1	26.64	74.97	25.03	
0.01	0.149	100	38.8	238.9	14.54	89.51	10.49	
0.00	0.105	140	12.8	251.7	4.80	94.30	5.70	
0.00	0.075	200	5.6	257.3	2.10	96.40	3.60	
0.00	0.000	Pan	8.5	265.8	3.18	99.59	0.41	
Passed Mesh Sieve								
TOTAL			265.8					

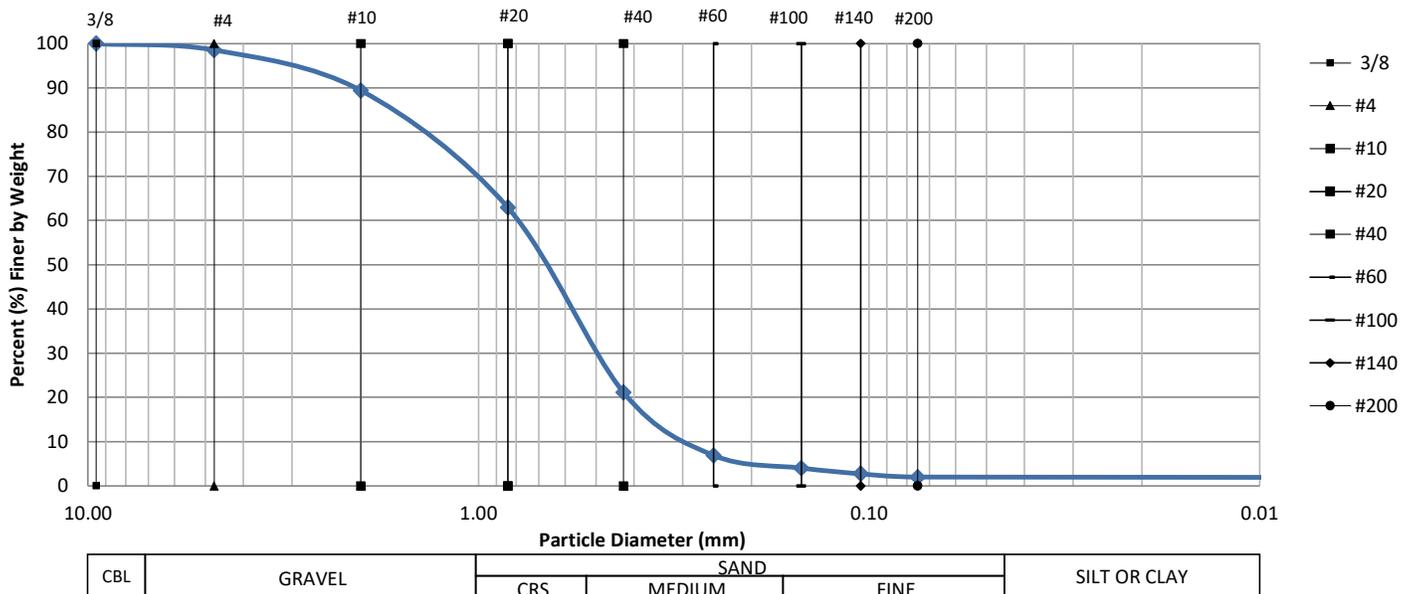




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

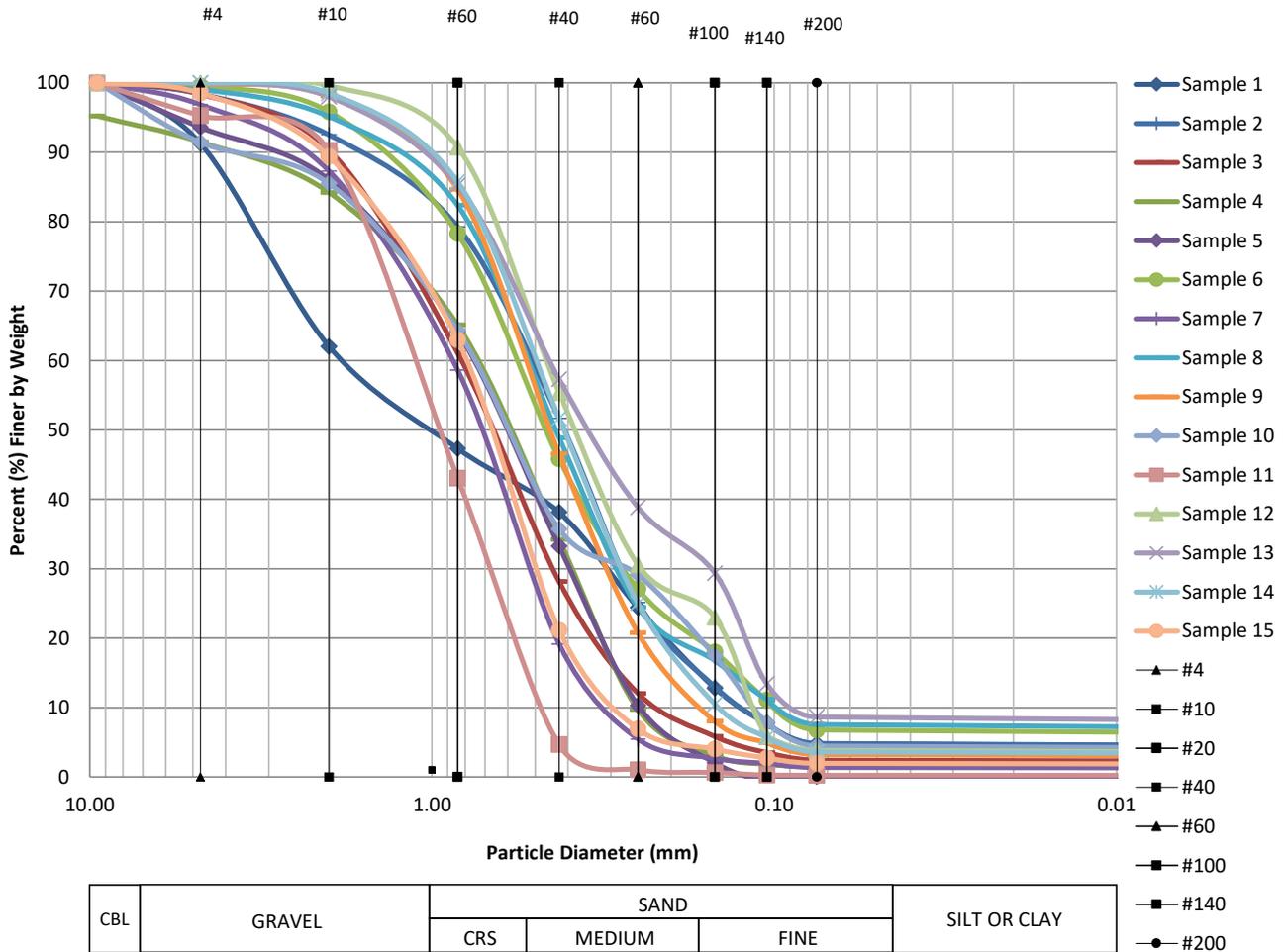
260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 15				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYY X/X				
DRY WEIGHT OF SAMPLE (grams): 350.7				SOURCE OF SAMPLE: MH-5 (9-19") RETEST				
PAN WEIGHT (grams): 193.4				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	5.2	5.2	1.48	1.48	98.52	
0.08	2.000	10	32.0	37.2	9.12	10.61	89.39	
0.03	0.841	20	92.7	129.9	26.43	37.04	62.96	
0.02	0.425	40	146.7	276.6	41.83	78.87	21.13	
0.01	0.250	60	49.9	326.5	14.23	93.10	6.90	
0.01	0.149	100	10.1	336.6	2.88	95.98	4.02	
0.00	0.105	140	4.5	341.1	1.28	97.26	2.74	
0.00	0.075	200	2.7	343.8	0.77	98.03	1.97	
0.00	0.000	Pan	5.6	349.4	1.60	99.63	0.37	
Passed Mesh Sieve								
TOTAL			349.4					



SIEVE ANALYSIS RESULTS AND COMPARISON SHEET

SAMPLE	DESCRIPTION
1	MH-1 (16-27")
2	MH-3 (7-14")
3	MH-3 (14-21")
4	MH-4 (5-14")
5	MH-4 (21-33")
6	MH-5 (0-9")
7	MH-5 (9-19")
8	MH-6 (0-14")
9	MH-6 (14-26")
10	MH-7 (0-6")
11	MH-7 (6-17")
12	MH-6 (0-14") RETEST
13	MH-5 (0-9") RETEST
14	MH-6 (14-26") RETEST
15	MH-5 (9-19") RETEST

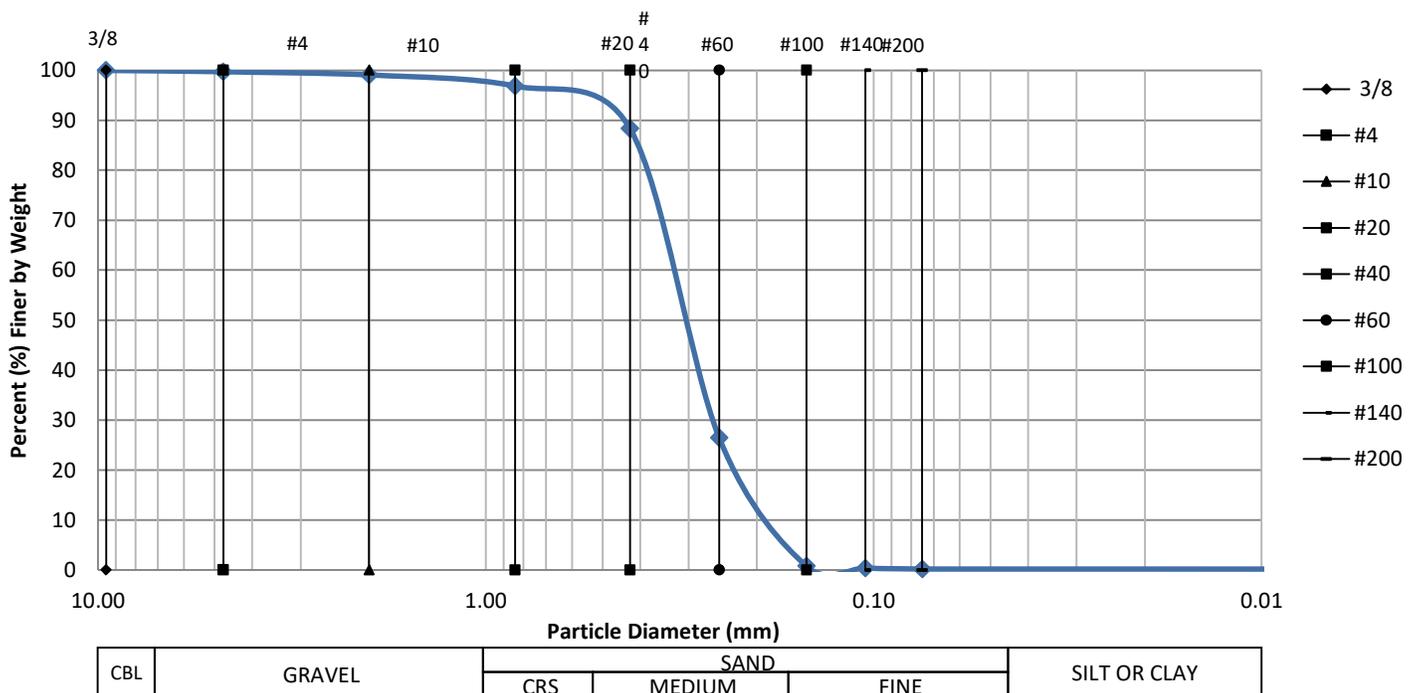




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 1				
DATE: 2/24/2023				PROJECT NUMBER: C23048.01				
TIME: 10:00AM				MUNSELL COLOR: XYYX X/X				
DRY WEIGHT OF SAMPLE (grams): 350.3				SOURCE OF SAMPLE: PH-1				
PAN WEIGHT (grams): 172.1				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	1.1	1.1	0.31	0.31	99.69	
0.08	2.000	10	2.2	3.3	0.63	0.94	99.06	
0.03	0.841	20	7.8	11.1	2.23	3.17	96.83	
0.02	0.425	40	29.8	40.9	8.51	11.68	88.32	
0.01	0.250	60	216.8	257.7	61.89	73.57	26.43	
0.01	0.149	100	89.8	347.5	25.64	99.20	0.80	
0.00	0.105	140	1.5	349.0	0.43	99.63	0.37	
0.00	0.075	200	0.6	349.6	0.17	99.80	0.20	
0.00	0.000	Pan	0.6	350.2	0.17	99.97	0.03	
Passed Mesh Sieve								
TOTAL			350.2					

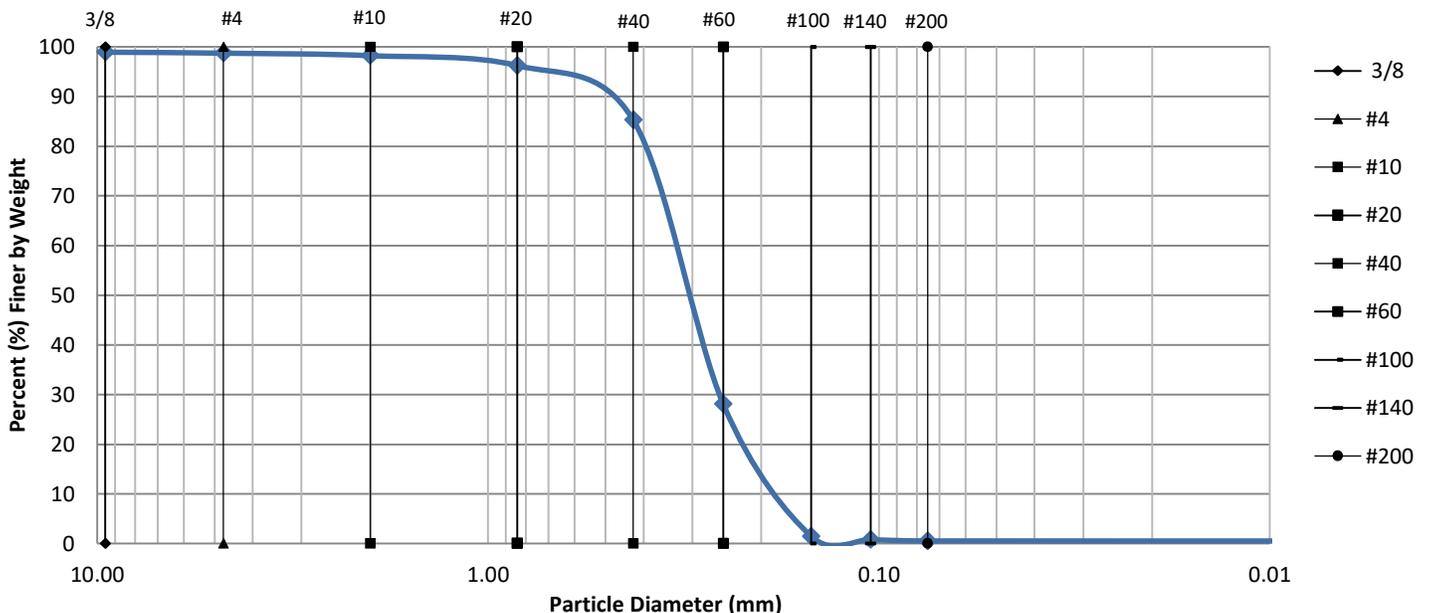




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

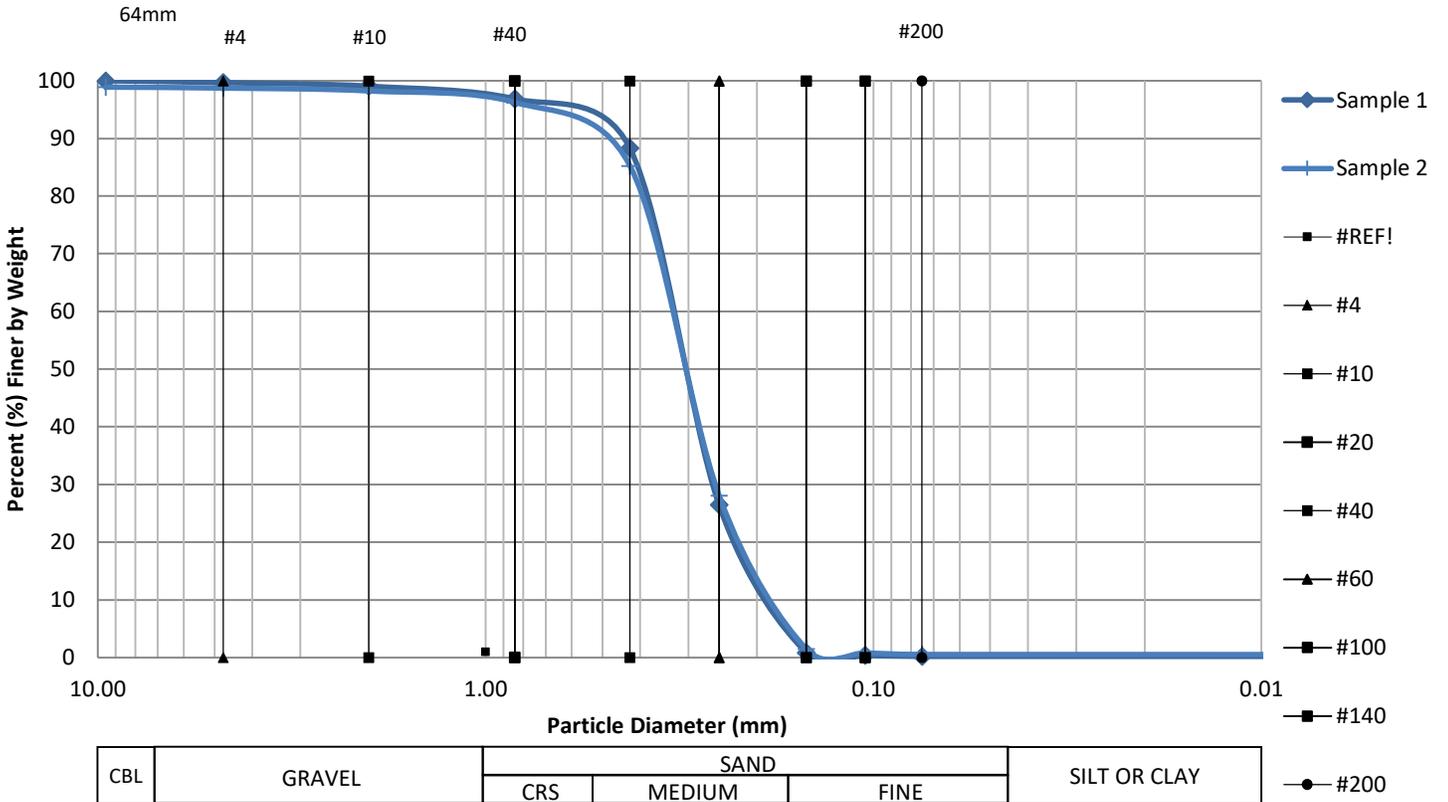
CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 2				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XYYX X/X				
DRY WEIGHT OF SAMPLE (grams): 333.5				SOURCE OF SAMPLE: PH-2				
PAN WEIGHT (grams): 193.4				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	3.6	3.6	1.08	1.08	98.92	
0.19	4.750	4	0.6	4.2	0.18	1.26	98.74	
0.08	2.000	10	1.7	5.9	0.51	1.77	98.23	
0.03	0.841	20	6.7	12.6	2.01	3.78	96.22	
0.02	0.425	40	36.5	49.1	10.94	14.72	85.28	
0.01	0.250	60	190.7	239.8	57.18	71.90	28.10	
0.01	0.149	100	88.8	328.6	26.63	98.53	1.47	
0.00	0.105	140	2.2	330.8	0.66	99.19	0.81	
0.00	0.075	200	0.9	331.7	0.27	99.46	0.54	
0.00	0.000	Pan	1.1	332.8	0.33	99.79	0.21	
Passed Mesh Sieve								
TOTAL			332.8					



CBL	GRAVEL	SAND			SILT OR CLAY
		CRS	MEDIUM	FINE	

SIEVE ANALYSIS RESULTS AND COMPARISON SHEET

SAMPLE	DESCRIPTION
1	PH-1
2	PH-2
3	
4	
5	
6	
7	
8	
9	

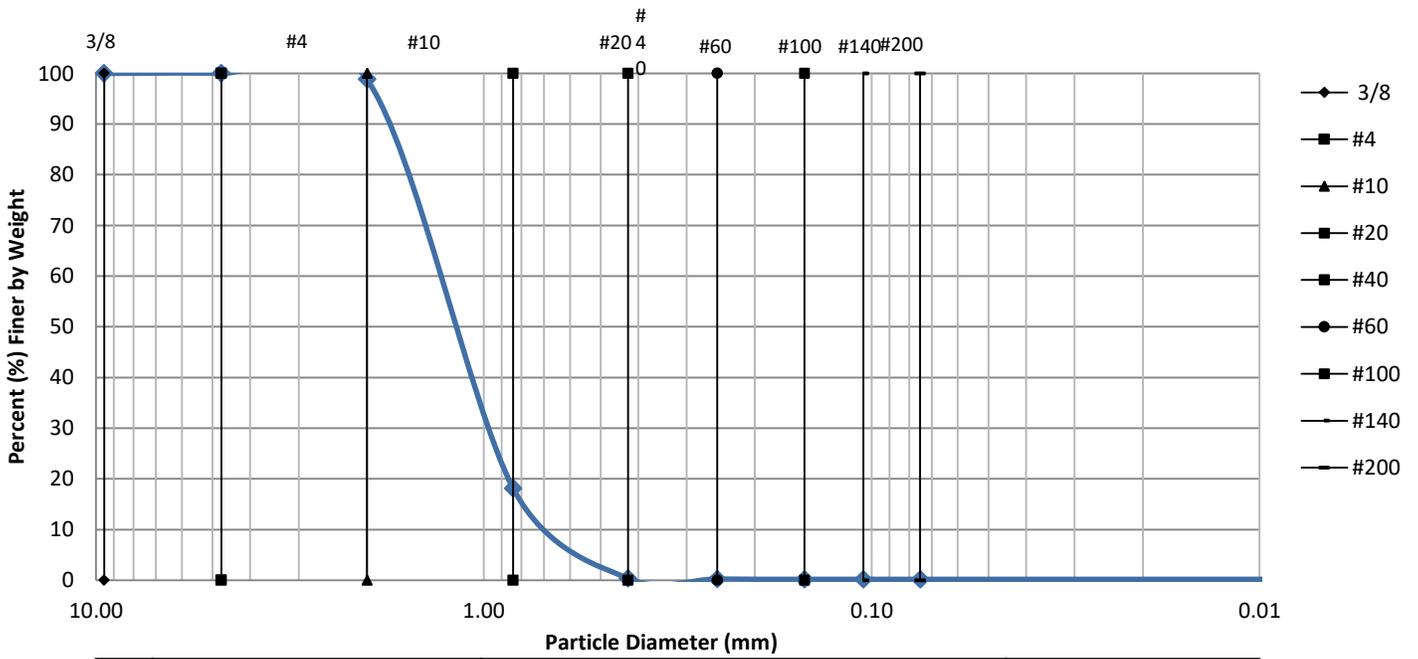




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 1				
DATE: 2/24/2023				PROJECT NUMBER: C23048.01				
TIME: 10:00AM				MUNSELL COLOR: XXYX X/X				
DRY WEIGHT OF SAMPLE (grams): 253.8				SOURCE OF SAMPLE: UH-1 (0-15")				
PAN WEIGHT (grams): 279.3				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	0.0	0.0	0.00	0.00	100.00	
0.08	2.000	10	3.0	3.0	1.18	1.18	98.82	
0.03	0.841	20	204.7	207.7	80.65	81.84	18.16	
0.02	0.425	40	45.2	252.9	17.81	99.65	0.35	
0.01	0.250	60	0.3	253.2	0.12	99.76	0.24	
0.01	0.149	100	0.1	253.3	0.04	99.80	0.20	
0.00	0.105	140	0.0	253.3	0.00	99.80	0.20	
0.00	0.075	200	0.0	253.3	0.00	99.80	0.20	
0.00	0.000	Pan	0.0	253.3	0.00	99.80	0.20	
Passed Mesh Sieve								
TOTAL			253.3					



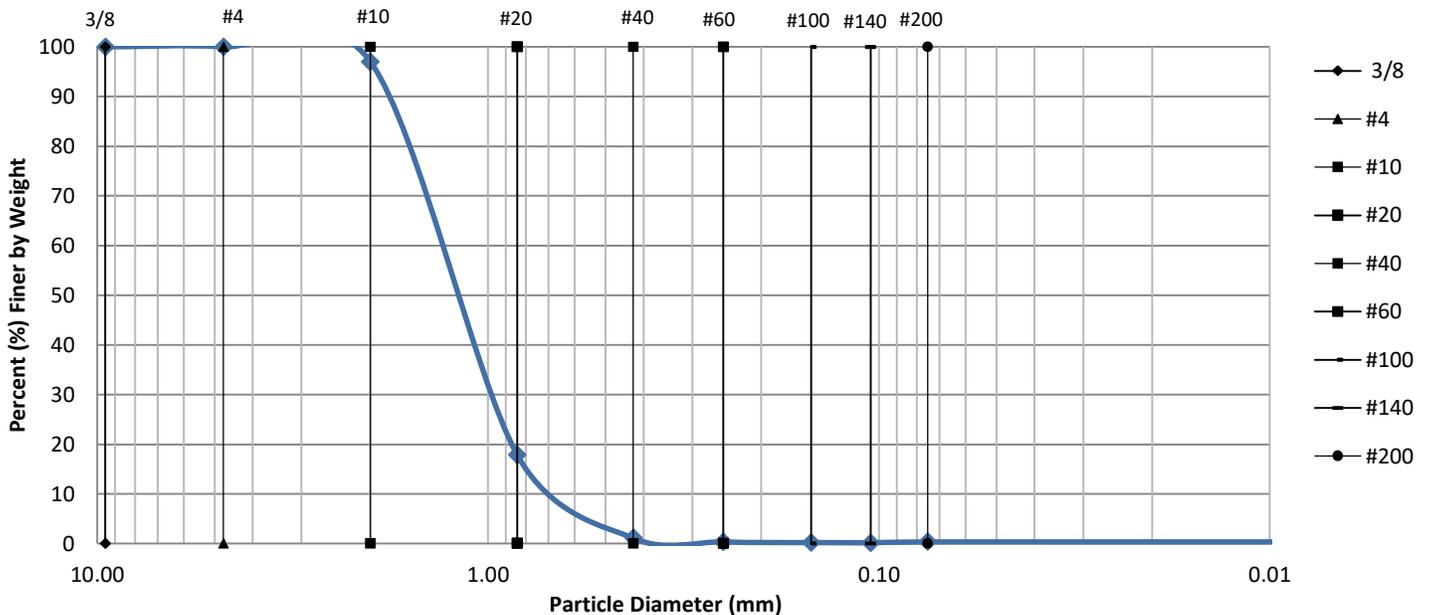
CBL	GRAVEL	SAND			SILT OR CLAY
		CRS	MEDIUM	FINE	



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

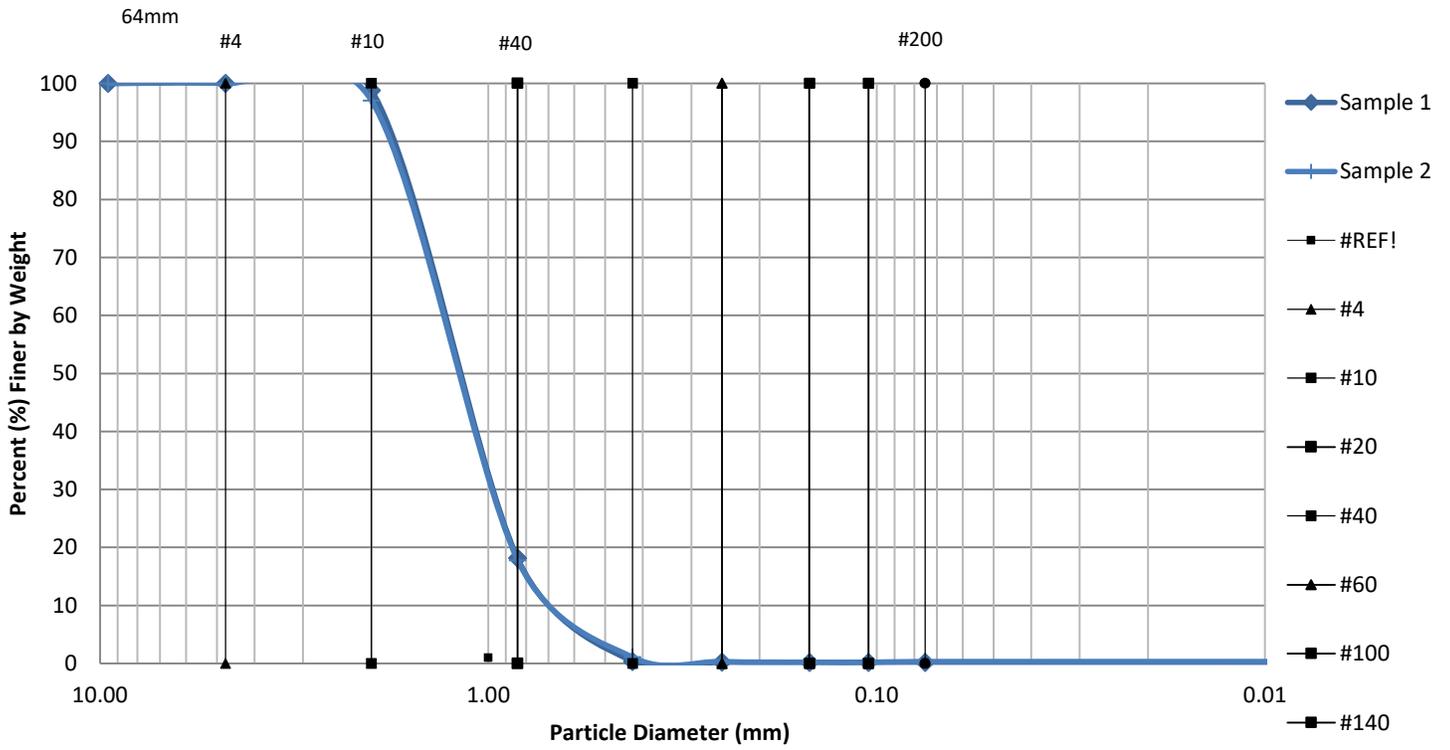
CLIENT: Arcadis / Nantucket Harbors Sediment Transport				SAMPLE NUMBER: 2				
DATE: 06/20-23/2023				PROJECT NUMBER: C23048.01				
TIME: 3 hours each				MUNSELL COLOR: XXYX X/X				
DRY WEIGHT OF SAMPLE (grams): 369.8				SOURCE OF SAMPLE: UH-2				
PAN WEIGHT (grams): 169.5				SAMPLED BY: Coastal Engineering		ANALYSIS BY: ACC		
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	0.0	0.0	0.00	0.00	100.00	
0.08	2.000	10	11.1	11.1	3.00	3.00	97.00	
0.03	0.841	20	292.8	303.9	79.18	82.18	17.82	
0.02	0.425	40	61.8	365.7	16.71	98.89	1.11	
0.01	0.250	60	2.9	368.6	0.78	99.68	0.32	
0.01	0.149	100	0.4	369.0	0.11	99.78	0.22	
0.00	0.105	140	0.2	369.2	0.05	99.84	0.16	
0.00	0.075	200	-0.7	368.5	-0.19	99.65	0.35	
0.00	0.000	Pan	0.4	368.9	0.11	99.76	0.24	
Passed Mesh Sieve								
TOTAL			368.9					



CBL	GRAVEL	SAND			SILT OR CLAY
		CRS	MEDIUM	FINE	

SIEVE ANALYSIS RESULTS AND COMPARISON SHEET

SAMPLE	DESCRIPTION
1	UH-1 (0-15")
2	UH-2
3	
4	
5	
6	
7	
8	
9	



APPENDIX D
GRAB SAMPLES - SIEVE ANALYSIS





SIEVE ANALYSIS RECORD SHEET

Project No: C23048.01

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

Client: Arcadis / Nantucket Harbors Sediment Transport

Date: 09/07-08/2023 **Time:** 3 hours each

Pre-Sieve Measurements:	I-1	MH-2	MH-4	MH-6	PH-1	PH-2	PH-3	PH-4	UH-1A	UH-2
SAMPLE	1	2	3	4	5	6	7	8	9	10
Pan ID	SP-1	SP7	SP-3	SP-4	SP-1	SP-1	SP-4	SP-5	SP-4	SP-5
Pan wt. (g)	299.6	286.2	175.2	172.1	299.6	299.6	172.1	197.4	172.1	197.4
Pan + Moist Sample (g)	555.7	555.0	528.4	565.5	555.0	554.0	555.0	555.2	552.2	558.4
Pan + Dry Sample (g)	518.6	523.2	495.1	385.2	502.9	540.1	526.7	370.2	464.5	488.8
Moisture Content (g)	37.1	31.8	33.3	180.3	52.1	13.9	28.3	185.0	87.7	92.9
% Moisture by weight	14.5	11.8	9.4	45.8	20.4	5.5	7.4	51.7	23.1	25.7

Oven:

Time in: -----

Time out: Each sample remained in oven for 3 hours

Weight Retained + Pan (g):

Sieve No.	SAMPLE									
	1	2	3	4	5	6	7	8	9	10
0.38	299.6	286.2	175.6	172.1	313.0	299.6	172.1	197.4	172.1	197.4
4	299.6	287.7	176.1	172.1	308.5	301.0	179.5	197.4	174.8	200.9
10	300.3	289.5	176.3	175.4	302.7	302.0	185.1	200.2	188.1	248.0
20	300.0	326.0	183.2	182.0	306.1	332.4	231.1	207.1	357.2	368.6
40	302.4	399.0	194.5	188.3	319.8	410.1	311.6	225.5	230.1	243.2
60	306.5	340.4	202.3	187.9	394.5	369.6	258.6	235.6	188.9	208.2
100	357.8	294.9	191.1	193.2	349.9	315.6	198.1	225.3	175.4	199.7
140	436.7	286.2	285.9	230.2	302.2	301.2	181.0	239.0	176.0	199.4
200	309.2	286.9	290.8	196.3	301.1	301.5	178.8	205.0	175.2	199.5
PAN	302.0	287.1	195.3	235.8	301.0	301.1	178.4	214.0	175.3	200.0

Sample Correspondence:

SAMPLE	DESCRIPTION
1	I-1
2	MH-2
3	MH-4
4	MH-6
5	PH-1
6	PH-2
7	PH-3
8	PH-4
9	UH-1A
10	UH-2

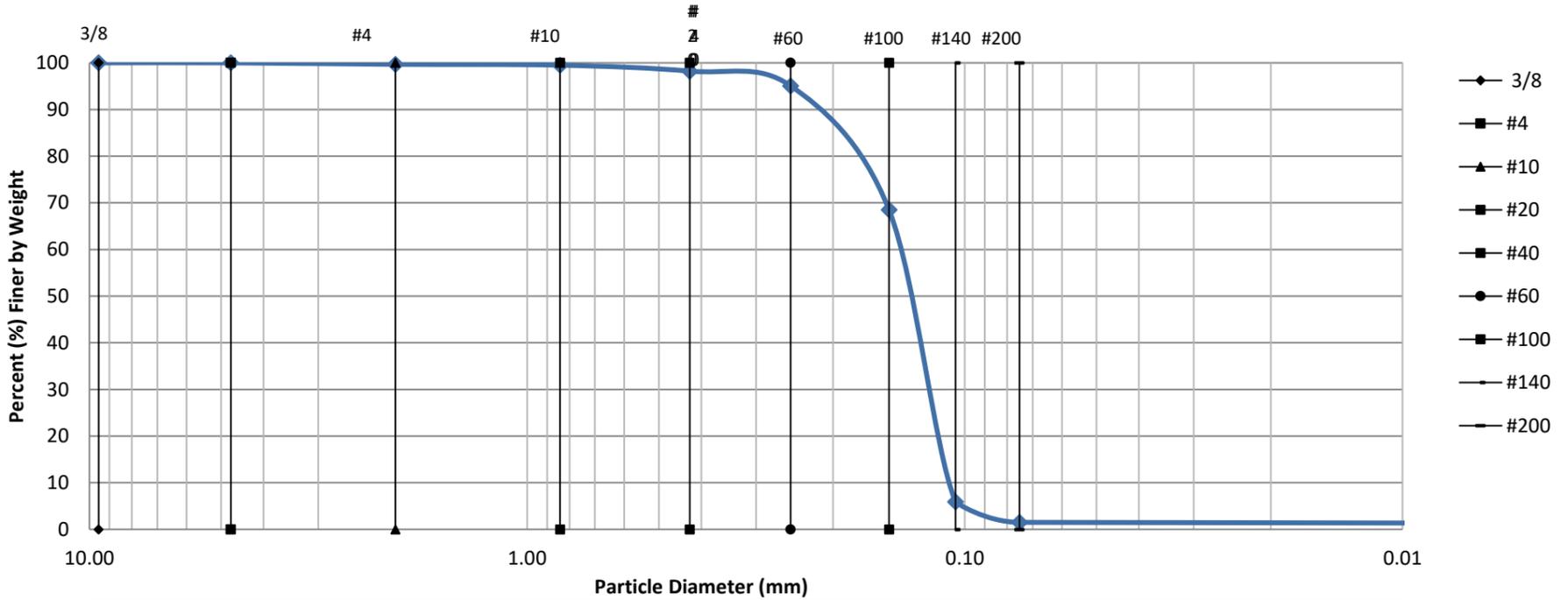
Sampled by: COASTAL ENGINEERING Analysis by: ACC



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 1					
DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 219.0			SOURCE OF SAMPLE: I-1					
PAN WEIGHT (grams): 299.6			SAMPLED BY: COASTAL ENGINEERING		ANALYSIS BY: ACC			
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	0.0	0.0	0.00	0.00	100.00	
0.08	2.000	10	0.7	0.7	0.32	0.32	99.68	
0.03	0.841	20	0.4	1.1	0.18	0.50	99.50	
0.02	0.425	40	2.8	3.9	1.28	1.78	98.22	
0.01	0.250	60	6.9	10.8	3.15	4.93	95.07	
0.01	0.149	100	58.2	69.0	26.58	31.51	68.49	
0.00	0.105	140	137.1	206.1	62.60	94.11	5.89	
0.00	0.075	200	9.6	215.7	4.38	98.49	1.51	
0.00	0.000	Pan	2.4	218.1	1.10	99.59	0.41	
Passed Mesh Sieve								
TOTAL			218.1					



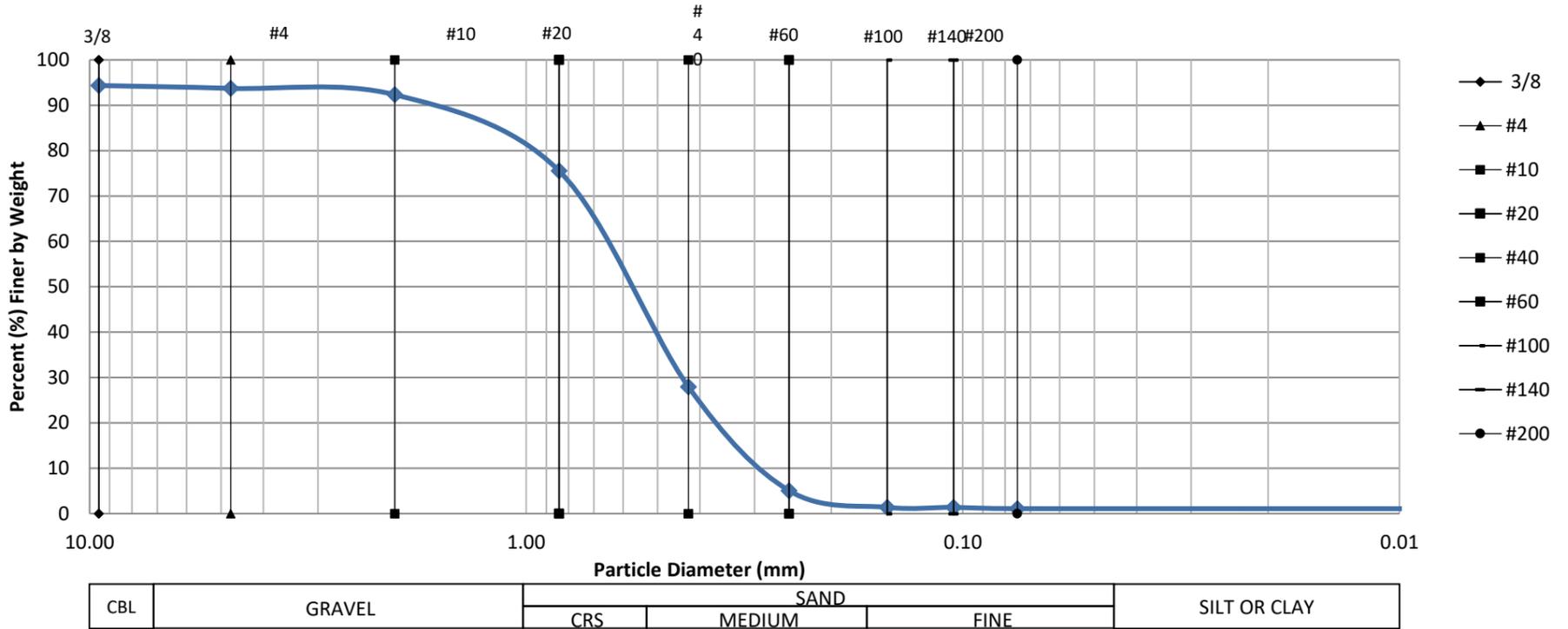
CBL	GRAVEL	SAND		SILT OR CLAY
		CRS	FINE	



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 2					
DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 237.0			SOURCE OF SAMPLE: MH-2					
PAN WEIGHT (grams): 286.2			SAMPLED BY: COASTAL ENGINEERING		ANALYSIS BY: ACC			
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	13.4	13.4	5.65	5.65	94.35	
0.19	4.750	4	1.5	14.9	0.63	6.29	93.71	
0.08	2.000	10	3.3	18.2	1.39	7.68	92.32	
0.03	0.841	20	39.8	58.0	16.79	24.47	75.53	
0.02	0.425	40	112.8	170.8	47.59	72.07	27.93	
0.01	0.250	60	54.2	225.0	22.87	94.94	5.06	
0.01	0.149	100	8.7	233.7	3.67	98.61	1.39	
0.00	0.105	140	0.0	233.7	0.00	98.61	1.39	
0.00	0.075	200	0.7	234.4	0.30	98.90	1.10	
0.00	0.000	Pan	0.9	235.3	0.38	99.28	0.72	
Passed Mesh Sieve								
TOTAL			235.3					

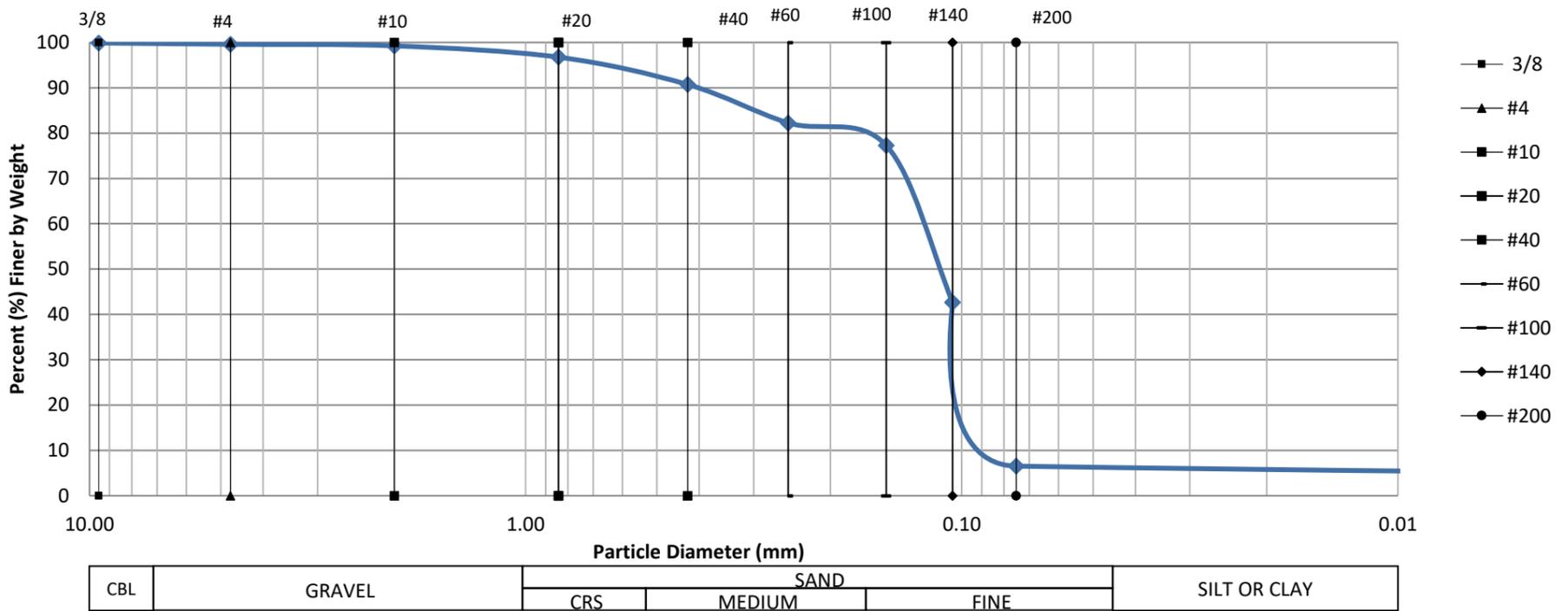




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 3					
DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 319.9			SOURCE OF SAMPLE: MH-4					
PAN WEIGHT (grams): 175.2			SAMPLED BY: COASTAL ENGINEERING		ANALYSIS BY: ACC			
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.4	0.4	0.13	0.13	99.87	
0.19	4.750	4	0.9	1.3	0.28	0.41	99.59	
0.08	2.000	10	1.1	2.4	0.34	0.75	99.25	
0.03	0.841	20	8.0	10.4	2.50	3.25	96.75	
0.02	0.425	40	19.3	29.7	6.03	9.28	90.72	
0.01	0.250	60	27.1	56.8	8.47	17.76	82.24	
0.01	0.149	100	15.9	72.7	4.97	22.73	77.27	
0.00	0.105	140	110.7	183.4	34.60	57.33	42.67	
0.00	0.075	200	115.6	299.0	36.14	93.47	6.53	
0.00	0.000	Pan	20.1	319.1	6.28	99.75	0.25	
Passed Mesh Sieve								
TOTAL			319.1					

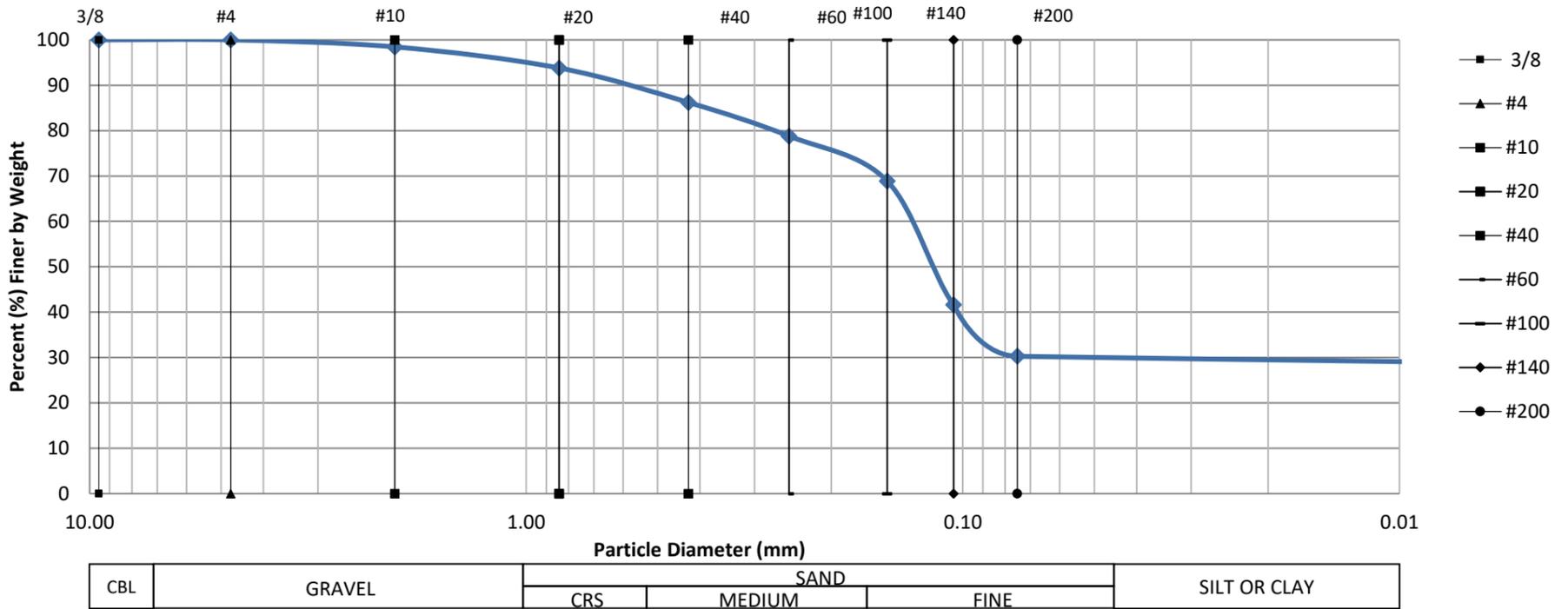




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 4					
DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 213.1			SOURCE OF SAMPLE: MH-6					
PAN WEIGHT (grams): 172.1			SAMPLED BY: COASTAL ENGINEERING					
			ANALYSIS BY: ACC					
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	0.0	0.0	0.00	0.00	100.00	
0.08	2.000	10	3.3	3.3	1.55	1.55	98.45	
0.03	0.841	20	9.9	13.2	4.65	6.19	93.81	
0.02	0.425	40	16.2	29.4	7.60	13.80	86.20	
0.01	0.250	60	15.8	45.2	7.41	21.21	78.79	
0.01	0.149	100	21.1	66.3	9.90	31.11	68.89	
0.00	0.105	140	58.1	124.4	27.26	58.38	41.62	
0.00	0.075	200	24.2	148.6	11.36	69.73	30.27	
0.00	0.000	Pan	63.7	212.3	29.89	99.62	0.38	
Passed Mesh Sieve								
TOTAL			212.3					

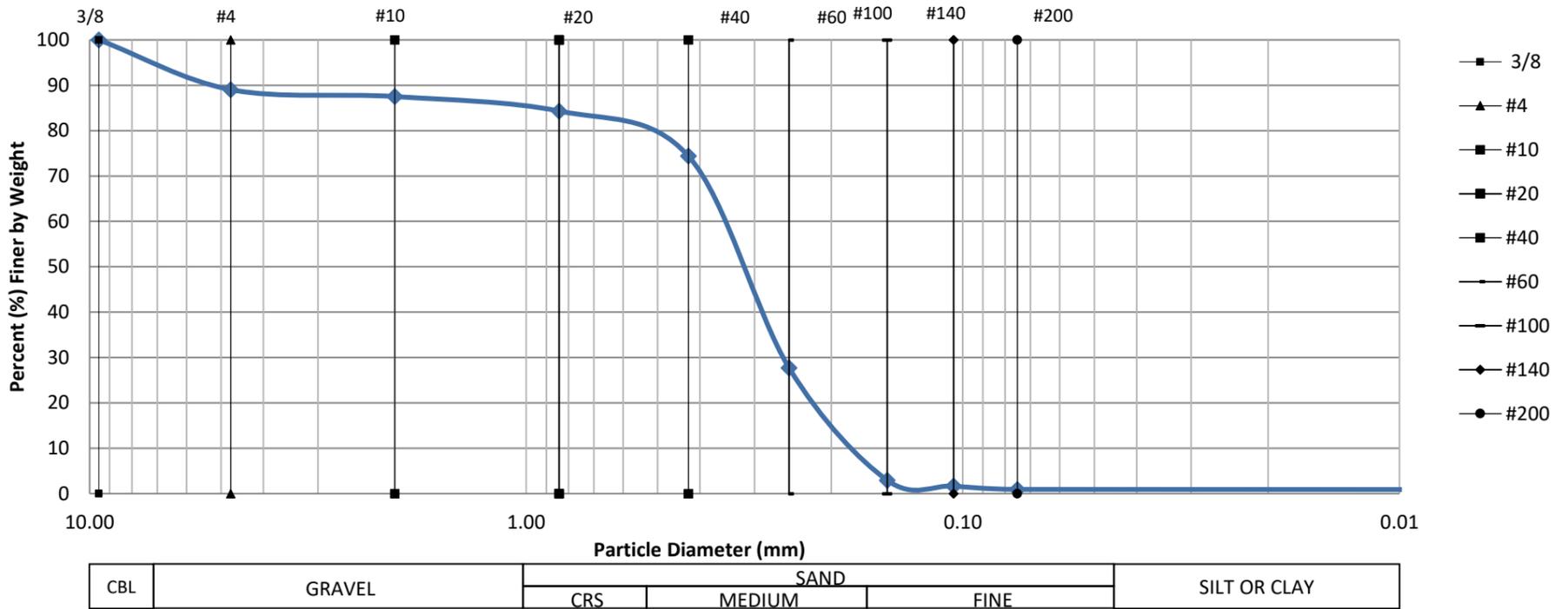




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 5					
DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 203.3			SOURCE OF SAMPLE: PH-1					
PAN WEIGHT (grams): 299.6			SAMPLED BY: COASTAL ENGINEERING					
			ANALYSIS BY: ACC					
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	13.4	13.4	6.59	0.00	100.00	
0.19	4.750	4	8.9	22.3	4.38	10.97	89.03	
0.08	2.000	10	3.1	25.4	1.52	12.49	87.51	
0.03	0.841	20	6.5	31.9	3.20	15.69	84.31	
0.02	0.425	40	20.2	52.1	9.94	25.63	74.37	
0.01	0.250	60	94.9	147.0	46.68	72.31	27.69	
0.01	0.149	100	50.3	197.3	24.74	97.05	2.95	
0.00	0.105	140	2.6	199.9	1.28	98.33	1.67	
0.00	0.075	200	1.5	201.4	0.74	99.07	0.93	
0.00	0.000	Pan	1.4	202.8	0.69	99.75	0.25	
Passed Mesh Sieve								
TOTAL				202.8				



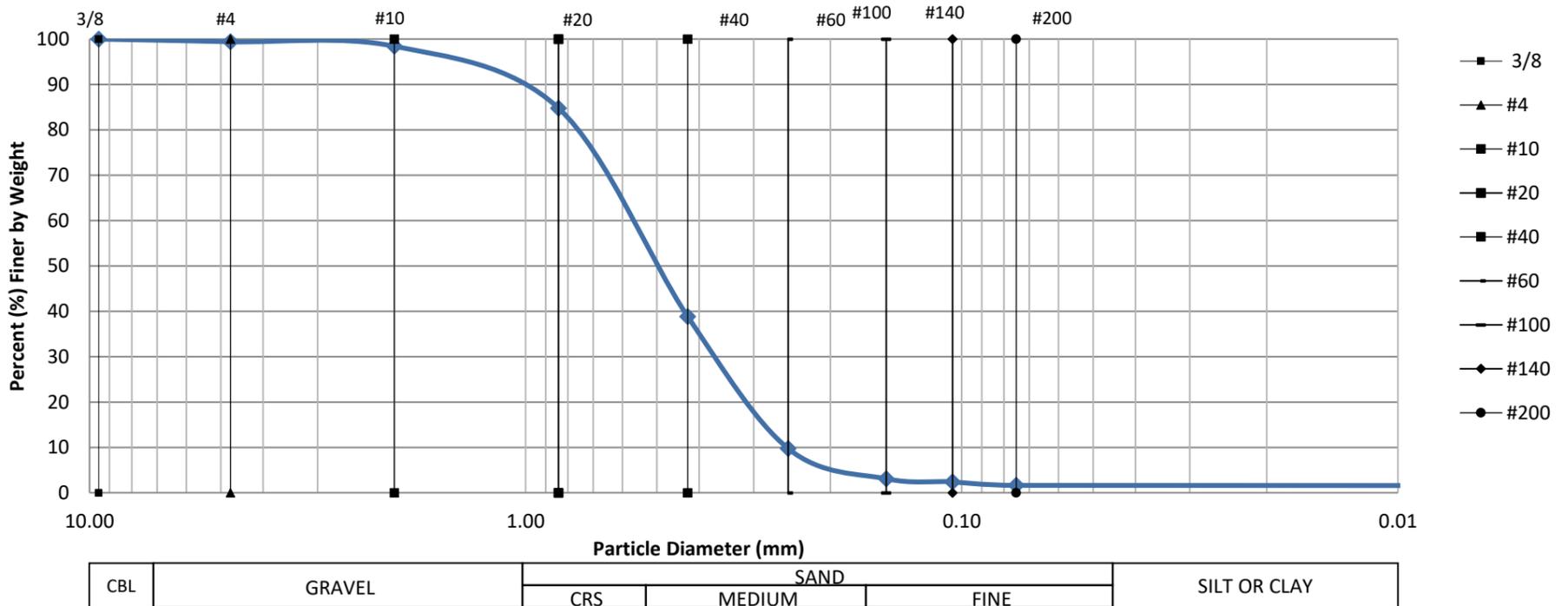
CBL	GRAVEL	SAND			SILT OR CLAY
		CRS	MEDIUM	FINE	



SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 6					
DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 240.5			SOURCE OF SAMPLE: PH-2					
PAN WEIGHT (grams): 299.6			SAMPLED BY: COASTAL ENGINEERING		ANALYSIS BY: ACC			
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	1.4	1.4	0.58	0.58	99.42	
0.08	2.000	10	2.4	3.8	1.00	1.58	98.42	
0.03	0.841	20	32.8	36.6	13.64	15.22	84.78	
0.02	0.425	40	110.5	147.1	45.95	61.16	38.84	
0.01	0.250	60	70.0	217.1	29.11	90.27	9.73	
0.01	0.149	100	16.0	233.1	6.65	96.92	3.08	
0.00	0.105	140	1.6	234.7	0.67	97.59	2.41	
0.00	0.075	200	1.9	236.6	0.79	98.38	1.62	
0.00	0.000	Pan	1.5	238.1	0.62	99.00	1.00	
Passed Mesh Sieve								
TOTAL				238.1				

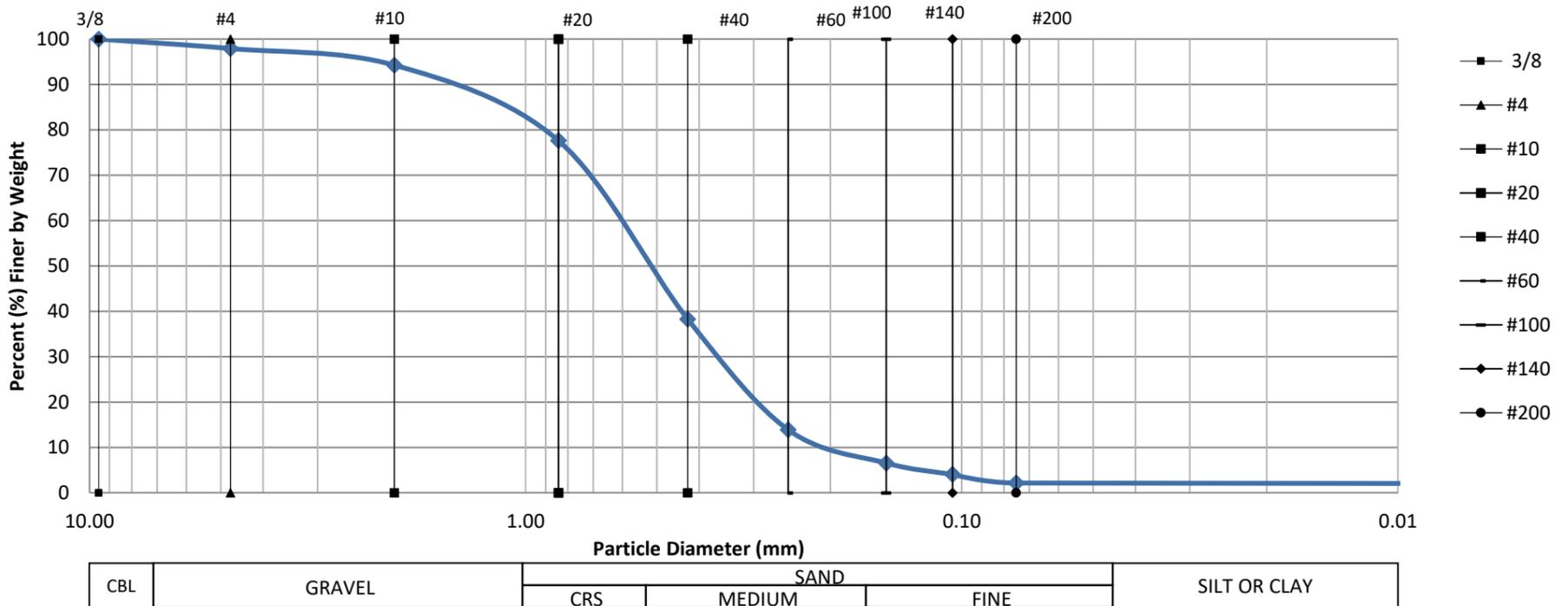




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 7					
DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 354.6			SOURCE OF SAMPLE: PH-3					
PAN WEIGHT (grams): 172.1			SAMPLED BY: COASTAL ENGINEERING		ANALYSIS BY: ACC			
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	7.4	7.4	2.09	2.09	97.91	
0.08	2.000	10	13.0	20.4	3.67	5.75	94.25	
0.03	0.841	20	59.0	79.4	16.64	22.39	77.61	
0.02	0.425	40	139.5	218.9	39.34	61.73	38.27	
0.01	0.250	60	86.5	305.4	24.39	86.13	13.87	
0.01	0.149	100	26.0	331.4	7.33	93.46	6.54	
0.00	0.105	140	8.9	340.3	2.51	95.97	4.03	
0.00	0.075	200	6.7	347.0	1.89	97.86	2.14	
0.00	0.000	Pan	6.3	353.3	1.78	99.63	0.37	
Passed Mesh Sieve								
TOTAL				353.3				

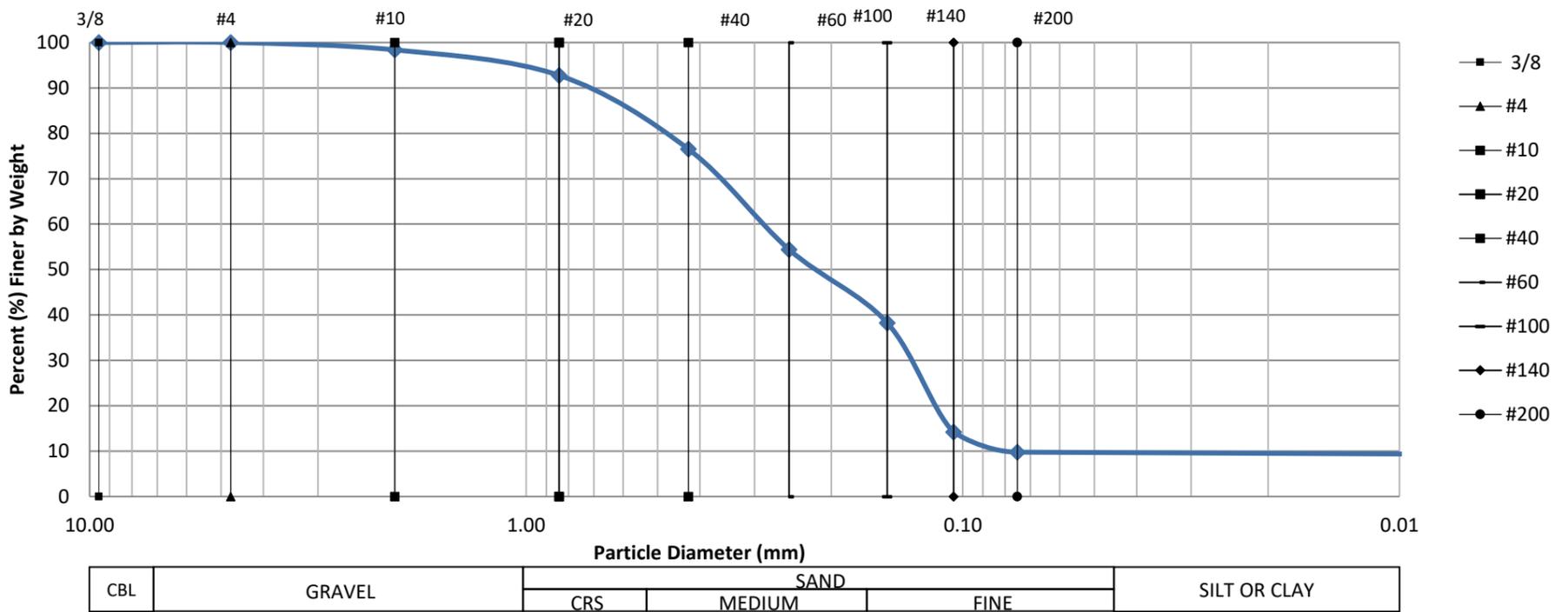




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

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DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 172.8			SOURCE OF SAMPLE: PH-4					
PAN WEIGHT (grams): 197.4			SAMPLED BY: COASTAL ENGINEERING					
			ANALYSIS BY: ACC					
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	0.0	0.0	0.00	0.00	100.00	
0.08	2.000	10	2.8	2.8	1.62	1.62	98.38	
0.03	0.841	20	9.7	12.5	5.61	7.23	92.77	
0.02	0.425	40	28.1	40.6	16.26	23.50	76.50	
0.01	0.250	60	38.2	78.8	22.11	45.60	54.40	
0.01	0.149	100	27.9	106.7	16.15	61.75	38.25	
0.00	0.105	140	41.6	148.3	24.07	85.82	14.18	
0.00	0.075	200	7.6	155.9	4.40	90.22	9.78	
0.00	0.000	Pan	16.6	172.5	9.61	99.83	0.17	
Passed Mesh Sieve								
TOTAL			172.5					

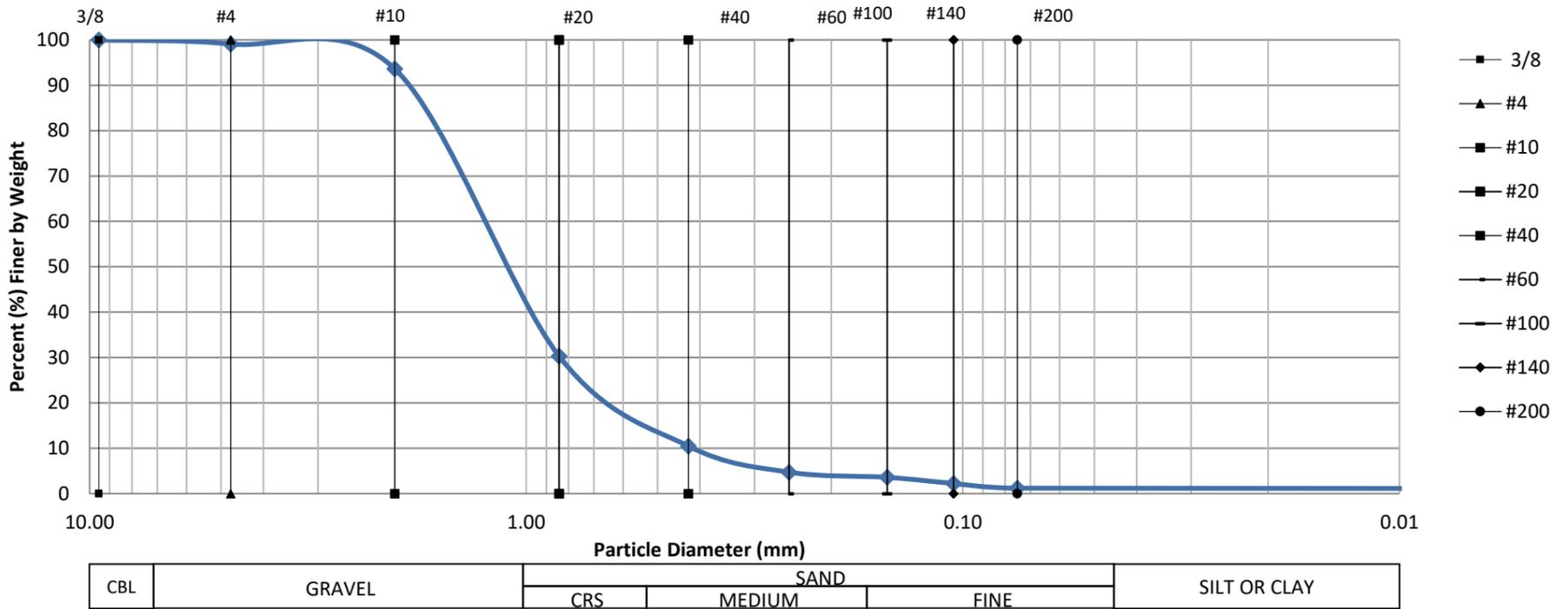




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 9					
DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 292.4			SOURCE OF SAMPLE: UH-1A					
PAN WEIGHT (grams): 172.1			SAMPLED BY: COASTAL ENGINEERING		ANALYSIS BY: ACC			
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	2.7	2.7	0.92	0.92	99.08	
0.08	2.000	10	16.0	18.7	5.47	6.40	93.60	
0.03	0.841	20	185.1	203.8	63.30	69.70	30.30	
0.02	0.425	40	58.0	261.8	19.84	89.53	10.47	
0.01	0.250	60	16.8	278.6	5.75	95.28	4.72	
0.01	0.149	100	3.3	281.9	1.13	96.41	3.59	
0.00	0.105	140	3.9	285.8	1.33	97.74	2.26	
0.00	0.075	200	3.1	288.9	1.06	98.80	1.20	
0.00	0.000	Pan	3.2	292.1	1.09	99.90	0.10	
Passed Mesh Sieve								
TOTAL			292.1					

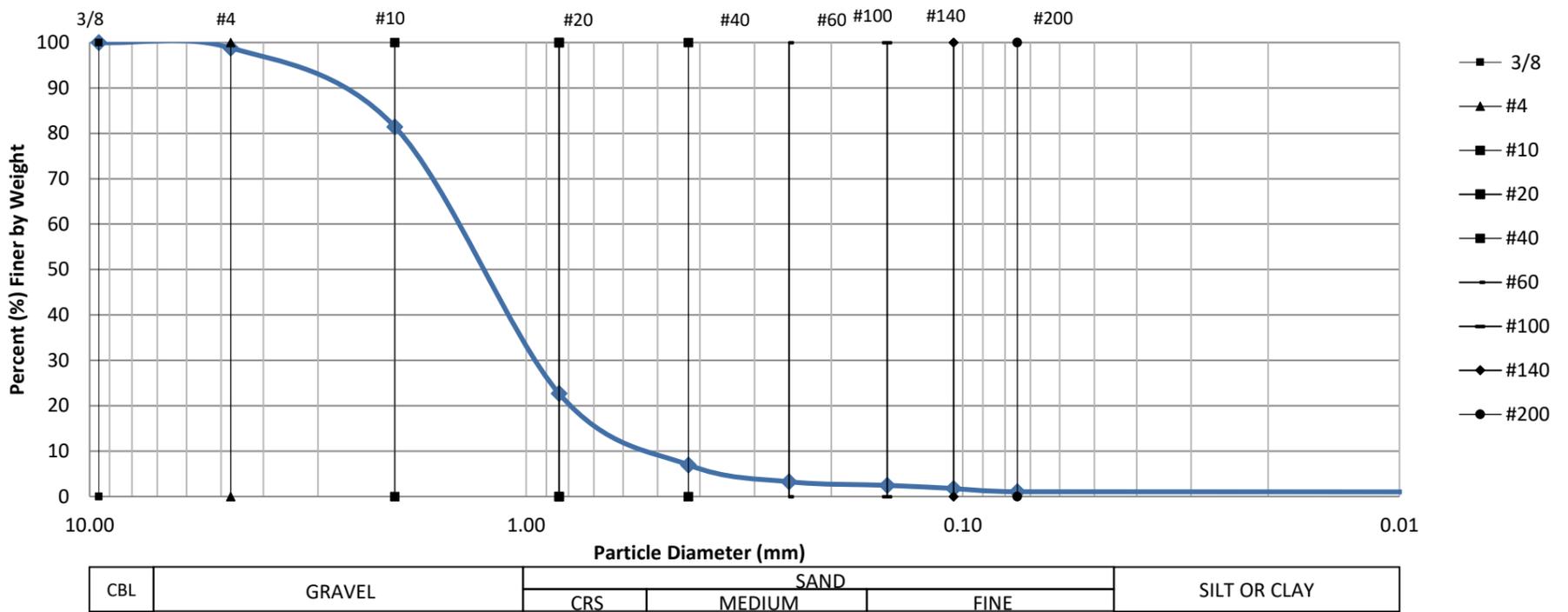




SIEVE ANALYSIS DATA AND COMPUTATION SHEET

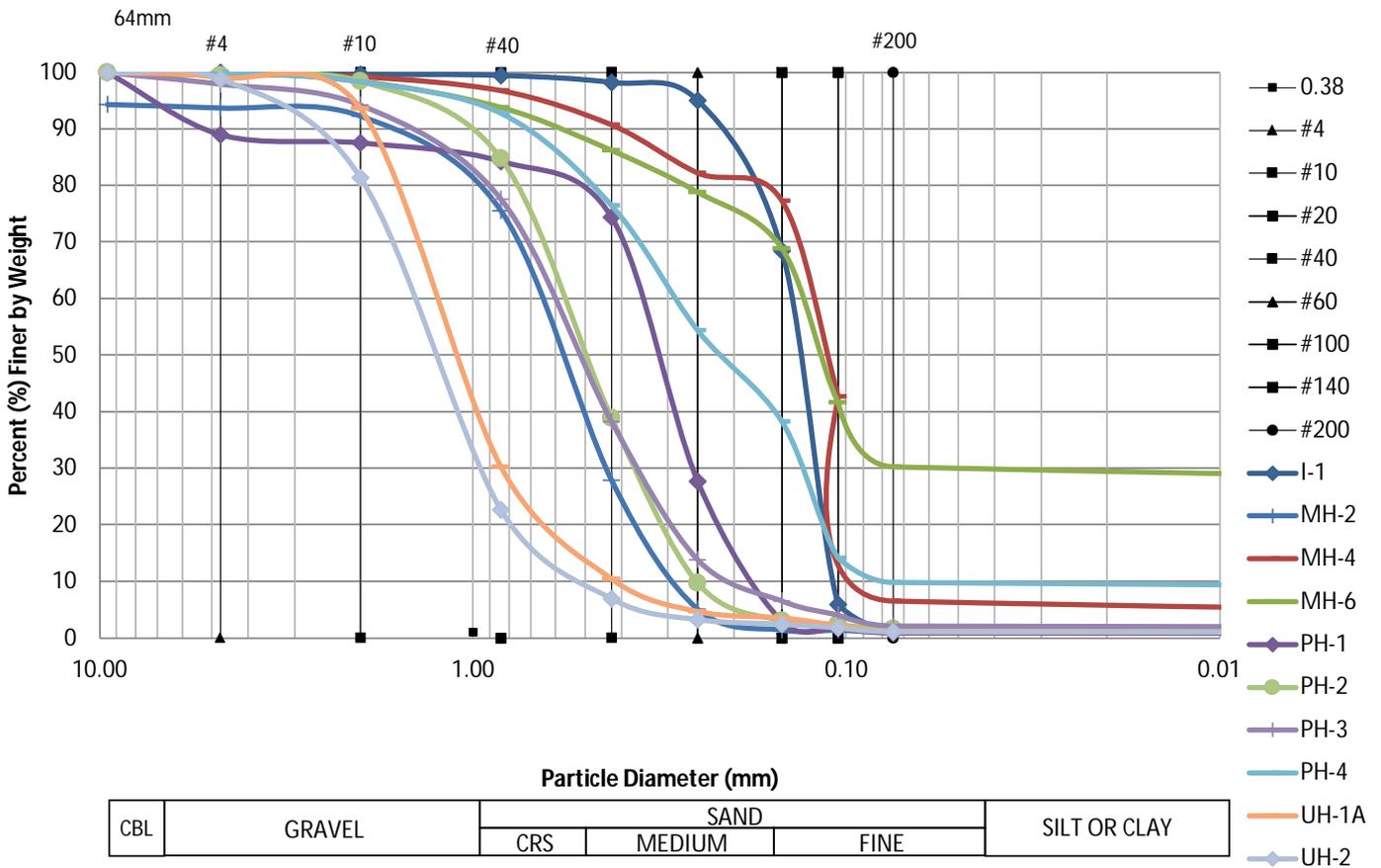
260 Cranberry Hwy., Orleans, MA 02653 508-255-6511 Fax: 508-255-6700

CLIENT: Arcadis / Nantucket Harbors Sediment Transport			SAMPLE NUMBER: 10					
DATE: 09/07-08/2023			PROJECT NUMBER: C23048.01					
TIME: 3 hours each			MUNSELL COLOR: XXYX X/X					
DRY WEIGHT OF SAMPLE (grams): 291.4			SOURCE OF SAMPLE: UH-2					
PAN WEIGHT (grams): 197.4			SAMPLED BY: COASTAL ENGINEERING		ANALYSIS BY: ACC			
Sieve Openings		U.S. Sieve	Weight Retained	Cumulative Weight Retained	Percent Retained	Cumulative Percent Retained	Percent Passing	Project Manual Specifications
Inches	Millimeters	Mesh	(grams)	(grams)				ASTM D422
0.38	9.525	3/8	0.0	0.0	0.00	0.00	100.00	
0.19	4.750	4	3.5	3.5	1.20	1.20	98.80	
0.08	2.000	10	50.6	54.1	17.36	18.57	81.43	
0.03	0.841	20	171.2	225.3	58.75	77.32	22.68	
0.02	0.425	40	45.8	271.1	15.72	93.03	6.97	
0.01	0.250	60	10.8	281.9	3.71	96.74	3.26	
0.01	0.149	100	2.3	284.2	0.79	97.53	2.47	
0.00	0.105	140	2.0	286.2	0.69	98.22	1.78	
0.00	0.075	200	2.1	288.3	0.72	98.94	1.06	
0.00	0.000	Pan	2.6	290.9	0.89	99.83	0.17	
Passed Mesh Sieve								
TOTAL			290.9					



SIEVE ANALYSIS RESULTS AND COMPARISON SHEET

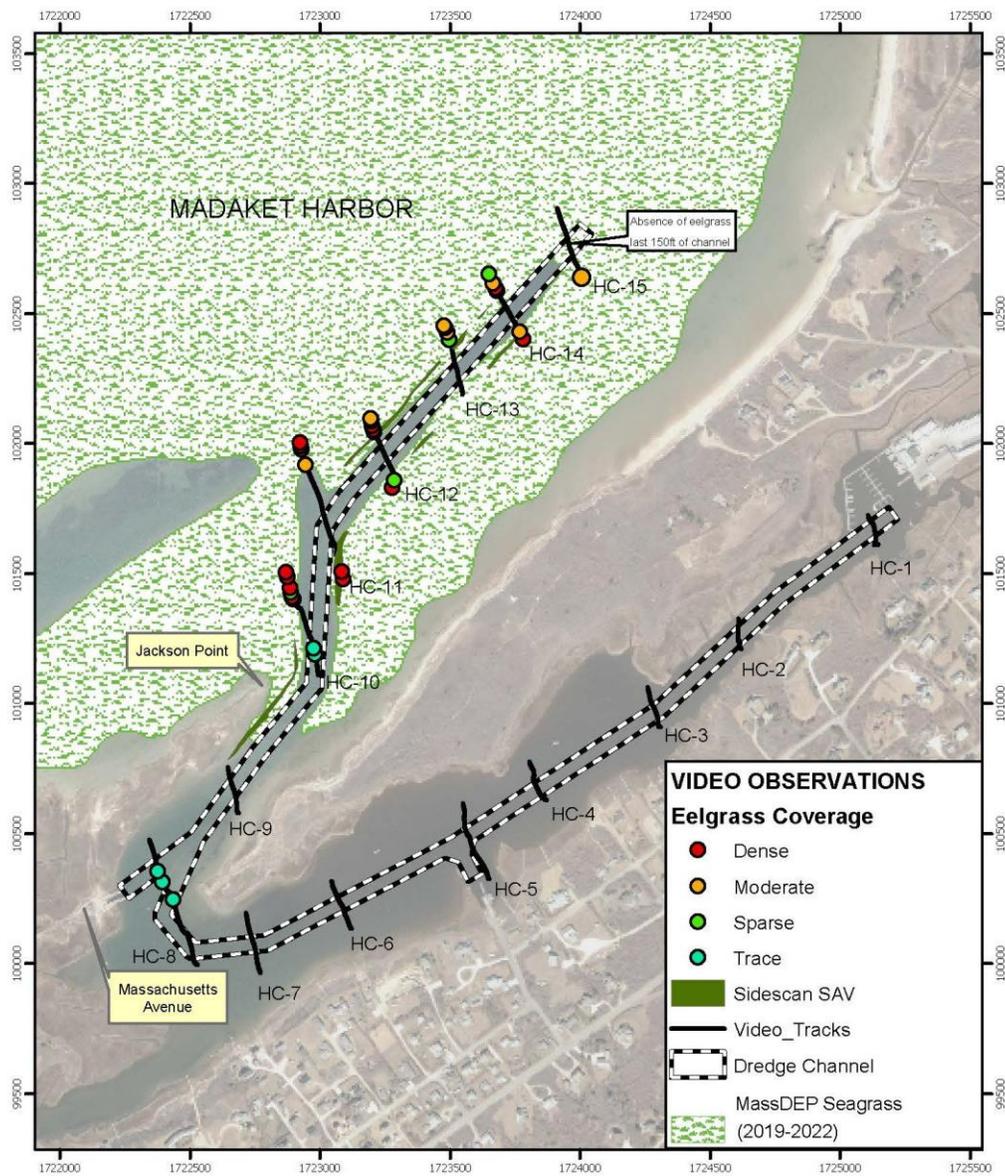
SAMPLE	DESCRIPTION
1	I-1
2	MH-2
3	MH-4
4	MH-6
5	PH-1
6	PH-2
7	PH-3
8	PH-4
9	UH-1A
10	UH-2



Attachment H

Eelgrass Findings

Eelgrass Acoustic & Video Surveys and Vibracore Sampling Polpis Harbor and Hither Creek, Nantucket, MA



Hither Creek eelgrass video observations and tracklines

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500 Edgewater Drive
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October 2025

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PLATES of Selected Underwater Video Screen Captures of Bottom Substrate and Biota

Plates 1-9 **Polpis Harbor**

Plates 10-24 **Hither Creek**

INTRODUCTION

CR Environmental, Inc. (CR) conducted acoustic, underwater video surveys and sediment sampling for Arcadis in Polpis Harbor, and the Hither Creek portion of Madaket Harbor, Nantucket, Massachusetts from September 2 – 6, 2025. The purpose of the surveys and sediment sampling was to map eelgrass within and adjacent to proposed dredge areas and collect sediment vibracores for grain size analyses. The surveys consisted of a combination of single beam echo sounding with precision navigation, high resolution side scan sonar and underwater video ground truthing. Sediment sampling was performed with a pneumatic vibracore system. NOAA (2018) topobathy LIDAR was used for planning.

2.0 METHODS

2.1 Vessel and Navigation

CR's truck and trailered vessel *Lophius* were transported from Hyannis to Nantucket on the Steamship Authority evening ferry from Hyannis on September 2nd and returned to Hyannis from Nantucket on the morning of September 6th. Due to calm sea conditions during the survey and sampling effort the vessel was able to transit by water from Nantucket Harbor to Madaket Harbor on September 3rd and return to Nantucket Harbor to be hauled out on September 5th.

Lophius is a 26-foot custom aluminum work boat with a large, enclosed pilothouse, bow-mounted hydraulic A-frame and hydraulic winch, benches for survey equipment, over-the-side transducer boom, and 110- and 12-volt power supplies. During the sediment sampling operation, the bow-door was lowered to the water's surface and the vessel used 15-foot spuds to hold position on station.

Navigation for the surveys was accomplished using a Hemisphere VS330 Real-time Kinematic Global Positioning System (RTK GPS). The accuracy of the navigation system is approximately 1.0 centimeter horizontally and 2 centimeters vertically (Root Mean Squared 1-sigma). Horizontal accuracy in differential or float mode is approximately 1 foot. RTK corrections were provided via NTRIP internet connection by Smartnet, Inc.

The RTK GPS was serially interfaced to a shipboard computer running HYPACK hydrographic surveying software. During the survey, this system calculated X and Y positions in the desired grid system (MA State Plane, Island NAD83, US Ft), recorded depth and navigation data, and provided a steering display for the vessel captain. HYPACK also depicted the progress of the survey using georeferenced imagery (e.g., orthophotos) as background files, ensuring that the entire survey area was adequately insonified.

For the vibracore operation, navigation was accomplished using a Hemisphere V-104 GPS Compass capable of providing sub-meter horizontal positions and vessel heading. The offset from the navigation antennae to the bow mounted A-frame was entered into HYPACK for accurate sediment sample positioning.

2.2 Survey Methods

The extent of each proposed dredge area to be surveyed was provided by Arcadis. The Polpis Harbor survey was performed during the morning of September 4th and covered approximately 6.9 acres of seabed. The Hither Creek survey was conducted in the afternoon of September 5th and covered approximately 10.1 acres of seabed.

2.2.1 Single beam acoustic survey and processing methods

Soundings were acquired using a Teledyne Odom Hydrographic EchoTrac CV-100 single beam echo sounder (SBES) equipped with an 8-degree 200-kHz transducer. In addition to recording streams of digital depths, the Odom system outputs graphical echograms to HYPACK software which can be used to map seabed features such as the presence/absence of submerged aquatic vegetation (SAV). Shore parallel transects with 20-foot transect spacing and a series of perpendicular cross lines were occupied to enable assessment of data accuracy.

System accuracy and the measured transducer draft were checked before data acquisition by comparing echo sounder water depth measurements to known water depths obtained using the “bar check” method in which a metal plate is lowered beneath the echo sounder’s transducer to a measured distance (5 feet) below the water’s surface. Additional calibrations were conducted *in situ* by collecting water column profiles of sound velocity using an AML-3 sound velocity profiler.

To map the area of submerged aquatic vegetation (SAV) the portions of the single beam echo sounder data files (echograms) with signatures associated with SAV were kept, and those without SAV signatures were deleted, yielding a database indicating SAV presence. Following review of the underwater video data which documented the presence of eelgrass, and the side scan sonar, SAV points corresponding to eelgrass were plotted in GIS to depict its distribution.

To create a map of site bathymetry the single beam echo sounder data was processed by removing outlying data points associated with water column interference (e.g., fish, SAV, debris). Data cleaning was guided by detailed inspection of the profile echograms for each line file. Cleaned bathymetric data were exported as an ASCII XYZ file and gridded to generate a bathymetric map referenced to NAVD88.

2.2.2 Side scan sonar acquisition and processing methods

The side scan sonar and bathymetric data were collected simultaneously. Side-scan sonar data were collected using an Edgetech, Inc. Model 4125 400/900 kHz system. The system was interfaced to a computer running Edgetech, Inc. Discover acquisition software. The acquisition computer was interfaced to a Hemisphere VS-330 RTK GPS via serial connection.

Sonar data were collected using both 400 and 900-kHz frequencies and a 49-foot (15 meter) range to accommodate the range of water depths encountered in each survey area while maximizing image resolution. Survey transects were spaced to ensure greater than 100 percent insonification of the survey areas.

Side-scan data were processed using Chesapeake Technology SonarWiz software. After correction for tow fish layback and signal attenuation, mosaics of 900-kHz data were created in georeferenced JPEG/TIF formats suitable for analysis using GIS or CAD software. Overlapping data were not blended in order to preserve detail.

Data are presented as gray shaded images. The shade of gray corresponds to the strength of the returning signal and can be used to infer bottom type (sediment texture) and to identify submerged aquatic vegetation (e.g., eelgrass), underwater structures or debris. A key to sonar shading is provided below.

Key to Side-scan Sonar Image Shading



Sonar shadow----- Weak Signal Return-----Strong Signal Return

In general, weak signal returns correspond to smooth substrates (e.g., fine sediments and ones with little microtopography), soft materials that absorb the signal, or seabed sloping away from the signal source (tow fish). These features appear lighter gray in sonar imagery. Strong signal returns correspond to rough substrates (e.g., gravel, cobble), highly reflective materials, or to a seabed sloping towards the signal source. These features appear as dark gray to black in the sonar imagery.

Eelgrass typically appears on the side scan mosaic as a distinctive rough irregular feature with low reflectivity.

2.2.3 Underwater video methods

An underwater video sled survey was performed on September 3rd following the acoustic survey at Polpis Harbor to confirm (i.e., ground truth) the estimated eelgrass distribution derived from the echo sounder data and provide photographic documentation of eelgrass density and plant health. Nine video transects were occupied across the survey area. At Hither Creek, the video sled survey was performed during the morning of September 5th and fifteen video transects were occupied.

Underwater video data were collected with CR's portable towed video sled consisting of a lightweight aluminum frame, Outland Technologies' high-resolution low light color camera, and two wide-angle LED video lights with variable output control. The video camera was cabled to an OTI-960 DVR recorder and high-resolution daylight monitor at the surface. Mounted lasers were set 25 cm apart on the video sled frame and used for scaling purposes. The video system was operated in "drift mode" and the vessel speed varied between 0.5 and 1 knot based on the wind and bottom currents. The video sled cable out was recorded, and the layback offset from the sled to the GPS antennae was entered into the HYPACK survey software. The sled was raised and lowered using a stern-mounted davit and lobster pot hauler, and the height of the system off the bottom was continuously adjusted to achieve the best bottom coverage and video quality. When

the video camera was one foot off the bottom, the viewing area of the camera was approximately 1.5 feet x 1.5 feet (18 inches x 18 inches), and the video quality was optimal for characterizing eelgrass densities, seabed substrate, and biota.

The underwater video data were reviewed by a marine biologist at the CR office, and the presence or absence of eelgrass, and the seabed substrate and biota were noted. At 30-60 second intervals along each transect the video footage was paused to take the recorded time on the video, screen captures and notes on the presence or absence of eelgrass, the seabed substrate and biota. Two screen captures from each transect were selected to illustrate eelgrass coverage and health, representative biota, and bottom substrates. Eelgrass coverage when present was estimated to be complete (90-100%), dense, (70-90% cover), moderate (30 to 70% cover), sparse (1-30% cover), or trace (less than 1%).

2.3 Vibracore Sampling Methods

Vibracore sampling was performed in Polpis Harbor during the afternoon of September 3rd and at Hither Creek during the morning of September 4th. Vibracores were obtained using CR's NAVCO pneumatic vibracore system that includes a 1,750 vpm Bin/Hopper Vibrator, 50 cfm portable air compressor and six-foot-long 3-inch diameter galvanized steel core barrels with core cutter/catcher assemblies, and 2 7/8-inch OD CAB rigid plastic liner. The liners were removed intact from the core barrels, labeled, and capped prior to sample processing onboard by Arcadis personnel. The station core ID, coordinates, time and date of collection, water depth, core penetration and recoveries were recorded in HYPACK and transferred to Excel format. Cores were collected to six feet below the mudline or to refusal.

3.0 RESULTS

The extent of eelgrass mapped by MassDEP (2019-2022) was obtained in shapefile format and is included on all figures for reference.

3.1 Acoustic Survey Results

Single beam and side scan sonar survey tracklines in Polpis Harbor and Hither Creek are shown in Figures 1 and 2, respectively. A total of 7.1-line miles were occupied at Polpis Harbor, and 10.8-line miles at Hither Creek.

3.1.1 Bathymetric results

NAVD88 elevations mapped in the Polpis Harbor dredge channel survey area ranged from -1.7 feet to -10.6 feet (Figure 3). The mean mapped elevation was -7.2 feet.

Seabed elevations mapped in Hither Creek, Madaket Harbor ranged from -2.6 feet to -9.6 feet NAVD88 (Figure 4). The mean mapped elevation was -6.8 feet.

3.1.2 Single beam and side scan sonar acoustic submerged aquatic vegetation mapping results

Distinct acoustic signatures indicating stands of submerged aquatic vegetation (SAV) rising above the seabed were observed on single beam echogram profiles and in the side scan sonar records and allowed the creation of SAV distribution layers for each survey area.

In Polpis Harbor, remote sensing technologies indicated that SAV was present in the western portion of the survey area (Figure 5) but not within the dredge footprint.

In Hither Creek, the single beam echo sounder echograms were not a reliable indicator of eelgrass SAV as documented by the underwater video. This was due to the presence of dense senescent eelgrass and algae within the creek channel. Eelgrass appeared on the side scan mosaic as a distinctive rough irregular feature. Side scan sonar indicated SAV adjacent to but not within the dredge footprint in areas mapped as eelgrass by MassDEP (Figure 6).

3.2 Underwater Video Results

3.2.1 Polpis Harbor underwater video eelgrass ground truth results

Nine underwater video transects were occupied in the Polpis Harbor entrance channel to ground truth the sonar survey results. Transects were run from east to west and ranged from 200 to 700

feet in length (average 530 feet). Wind, currents and channel configuration made the video drifts challenging. Video footage duration varied from 4 to 20 minutes dependent on transect length and bottom currents.

Eelgrass was only observed on two of the nine video transects (PH-1 and PH-2) at the western end of the survey limits (Figure 7). The label for each transect marks the start. Two screen captures (A and B) were taken along each video transect within and proximate to the dredge channel to illustrate eelgrass coverage, associated biota, and bottom substrates (Plates 1-9 and Figure 8).

On transect PH-1 there was only one observation of sparse eelgrass, and it was on the southern edge of the dredge channel (Figure 8, Plate 1 screen capture PH-1B). Transect PH-2 had areas of eelgrass with trace to dense coverage but was outside the dredge channel along its northern edge and adjacent to the MassDEP mapped eelgrass layer (Figure 7).

The observed eelgrass was found in flat sand bottom and often associated with species of branching and tufted red algae. Plants appeared healthiest outside the dredge channel and were estimated to be 1 to 2 feet in height.

Other video observations shown on Plates 1-9 of biota and bottom substrate within the Polpis Harbor dredge channel included:

- Muddy sand substrates with crab burrows and scallop shells at transects PH-3 and PH-4,
- Low amplitude sand waves at transect PH-6 in an area of higher current, and
- Mats of dead and decaying eelgrass and dense macro algae at transects PH-7, PH-8, and PH-9 within the channel at the southeastern end of the survey area.

At transect PH-8 and PH-9 white sulfur bacteria (*Beggiatoa*) was observed, an indication of minimal water circulation and anoxic conditions. The stagnant water and anoxic conditions from decaying algae are likely contributing to the lack of eelgrass in the southeastern portion of the Polpis Harbor channel.

Nine invertebrates, four fish, and three algal species were observed during the Polpis Harbor video survey.

Invertebrates included bay scallop (*Argopecton irradians*), blue crab (*Callinectes sapidus*), boring sponge (*Cliona celata*), breadcrumb sponge (*Halichondria panicea*), carnation worm (*Hydroides dianthus*), eastern oyster (*Crassostrea virginica*), encrusting bryozoan (*Schizoporella unicornis*), boring anemone (*Ceriantheopsis americana*), and the white invasive tunicate (*Didemnum* spp.)

Fish species observed included pufferfish (*Sphaeroides maculatus*), scup (*Stenotomas chrysops*), silversides, (*Menidia menidia*), and juvenile black sea bass (*Centropristis striata*). The algal species encountered were branching and tufted red algae (Rhodophyta), and dead man's fingers (*Codium fragile*).

The most frequent fish species was juvenile pufferfish observed on five of the nine Polpis Harbor transects. Two large schools of silverside minnows were also observed. The dominant invertebrate was bay scallop, and scallop shells were observed on several transects. Branching red algae, comprising several species was the dominant algae throughout the survey corridors.

3.2.2 Underwater video ground truth results Hither Creek

Fifteen underwater video transects were occupied along the Hither Creek channel in Madaket Harbor. Transects were run from southeast to northwest, roughly perpendicular to the channel. Transect length averaged 250 feet and ranged from 150 to 550 feet. Video footage duration varied from 4 to 9 minutes.

Eelgrass was observed at seven of the western transects north of Massachusetts Avenue and Jackson Point. The only video observations of eelgrass in the dredge channel were at transects HC-8 and HC-10 (Figure 9). Eelgrass coverage was trace (only single blades) at transect HC-8 north of the channel inflexion point near Massachusetts Avenue (Plate 17 screen capture HC-8B), and transect HC-10 (Plate 19, screen capture HC-10A).. Eelgrass observed on the more northerly five transects (HC-11, -12, -13, -14, and -15) was outside the Hither Creek channel within the MassDEP mapped eelgrass area. No eelgrass was found along the southeastern reach of Hither Creek on transects HC-1 to HC-7.

Two screen captures (A and B) were taken along each video transect within and proximate to the dredge channel to illustrate eelgrass cover, biota, and bottom substrates (Figure 10, Plates 10 to 24).

The single blades of eelgrass observed within the channel at transect HC-8 and HC-10 (Figure 9) were associated with branching red algae and a sandier bottom. The eelgrass outside the northwestern branch of the channel was coincident with the MassDEP seagrass layer, healthier, denser, and more meadow-like (Plates 20 to 24).

No eelgrass was observed along the Hither Creek southeastern transects (HC-1 to HC-7) where a softer, muddy-silt bottom with crab burrows, and amphipod tubes was observed. Dense patches of macro algae were observed at the edges of channel. In the center of the channel especially in areas of poor circulation, there were several observations of dead decaying eelgrass and the sulfur-oxidizing bacteria *Beggiatoa*. These microbial mats appear white because the bacteria store elemental sulfur granules as they convert hydrogen sulfide into energy. They thrive at the interface between oxygenated and anoxic zones, making them good indicators of pollution.

Biota observed during the Hither Creek video survey included nine invertebrates, three fish, and four algal species.

Invertebrates included amphipods (*Ampelisca* spp.), bay scallop (*Argopecton irradians*), barnacles (*Balanus* spp.), blue crab (*Callinectes sapidus*), grass shrimp (*Palaemonetes* spp.), hermit crab (*Pagurus pollicaris*), horseshoe crab (*Limulus polyphemus*), parchment worm (*Chaetopterus* spp.), and spider crab (*Libinia emarginata*).

Fish species observed included pufferfish (*Sphaeroides maculatus*), scup (*Stenotomas chrysops*), and juvenile black sea bass (*Centropristis striata*).

The algal species encountered were branching red algae (Rhodophyta), dead man's fingers (*Codium fragile*), sea lettuce (*Ulva lactuca*), and tufted red algae (Rhodophyta).

Unlike Polpis Harbor where more hard bottom invertebrate species such as sponges, encrusting bryozoans, and white invasive tunicates were observed, Hither Creek had more soft bottom invertebrate species.

Dominant invertebrates in Hither Creek were blue crabs and glass shrimp which were abundant within the large patches of red branching algae.. There were also multiple observations of horseshoe crabs. Very few fish were observed at Hither Creek, with singular observations of black sea bass, pufferfish, and scup. The dominant algae were red branching algae often in large patches mixed with dead man's fingers, and sea lettuce.

3.3 Eelgrass Extent Based on Combined Acoustic and Video Evidence

At Polpis Harbor video observations strongly agreed with the single beam echosounder and side scan sonar acoustic data and the MassDEP mapped eelgrass data (Figure 5) indicating that eelgrass was only found outside the dredge channel. The video data did however suggest that "sparse" eelgrass may have slightly encroached towards a small portion of the southern edge of the dredge footprint along the western transect PH-1 (Figure 7, Plate 1. Screen capture PH1-B).

Similarly at Hither Creek little to no eelgrass was found within the dredge footprint. Video observations very closely matched the MassDEP mapped eelgrass layer. Exceptions were:

- A lack of eelgrass observed at the northern extent of the creek at video transect HC-15; no submerged aquatic vegetation was indicated by acoustics here as well, and
- "Trace" eelgrass blades observed at transects HC-8 and HC-10 (Figure 9, Plate17 screen capture HC-8B, and Plate 19 screen capture HC-10A).

The single beam echosounder mapping of submerged aquatic vegetation (SAV) correctly suggested eelgrass within the MassDEP mapped data, however, was "non conservative" within the creek dredge footprint suggesting eelgrass extents not documented by video (Figure 6). This was due to dense patches of algae and rafts of senescent eelgrass registering as SAV.

Eelgrass data density/distribution wasn't sufficient for construction of GIS polygons.

3.4 Vibracore Sediment Sampling Results

On September 3, 2025, two vibracore samples were collected for grain size in the Polpis Harbor dredge channel following acoustic operations. After transiting to Madaket Harbor five vibracore samples were collected in Hither Creek on September 4th. Samples were transferred to Arcadis

personnel in the field for processing. Station IDs, coordinates, water depth, sediment penetrations, and recoveries at Polpis Harbor and Hither Creek are provided in Table 1. Sediment recovery for the Polpis Harbor cores was 2.5 feet at the southeastern end of the channel in Polpis Harbor and 5.5 feet in Nantucket Harbor. Recovery for the Hither Creek cores ranged from 1.2 to as much as 5.1 feet in an area of sand accumulation at the inflexion point of the channel.. Vibracore sampling locations are plotted on Figure 11 for Polpis Harbor and Figure 12 for Hither Creek.

REFERENCES

NOAA. 2018. <https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=8688>. 2018 USACE NCMP Topobathy Lidar DEM: East Coast (CT, MA, ME, NC, NH, RI, SC).

U.S. Army Corps of Engineers. 30 November 2013. *Engineering and Design. Hydrographic Surveying*. EM 1110-2-1003.

FIGURES

TABLE 1

**SEDIMENT VIBRACORES
NANTUCKET EELGRASS SURVEYS
Polpis Harbor and Hither Creek
*Depths in feet***

X	Y	ID	SITE	Date/Time Acquired	Latitude	Longitude	Water Depth	Penetration	Recovery
1772042.7	110762.8	4PH1-A	Polpis Harbor	9/3/2025 15:14	41 18 10.774 N	070 01 15.4158 W	6.2	3.0	2.5
1770575.1	111540.9	1PH3-A	Polpis Harbor	9/3/2025 15:29	41 18 18.5415 N	070 01 34.589 W	0.7	6.0	5.5
1724855.3	101494.1	18HC1-A	Hither Creek	9/4/2025 9:37	41 16 41.3134 N	070 11 34.0958 W	8.5	3.0	2.6
1723290.0	100338.6	14HC1-A	Hither Creek	9/4/2025 9:58	41 16 29.9519 N	070 11 54.6491 W	7.2	2.0	1.7
1722610.1	100059.3	11HC2-A	Hither Creek	9/4/2025 10:11	41 16 27.2154 N	070 12 3.567 W	6.2	4.6	4.6
1722497.5	100409.3	7HC3-A	Hither Creek	9/4/2025 10:25	41 16 30.6773 N	070 12 5.0258 W	4.8	5.4	5.1
1723001.2	101439.4	3HC1-A	Hither Creek	9/4/2025 10:47	41 16 40.8377 N	070 11 58.3822 W	8.2	2.0	NR
1722999.1	101441.3	3HC1-B	Hither Creek	9/4/2025 10:52	41 16 40.8569 N	070 11 58.4093 W	8.3	1.2	1.2

NOTES:

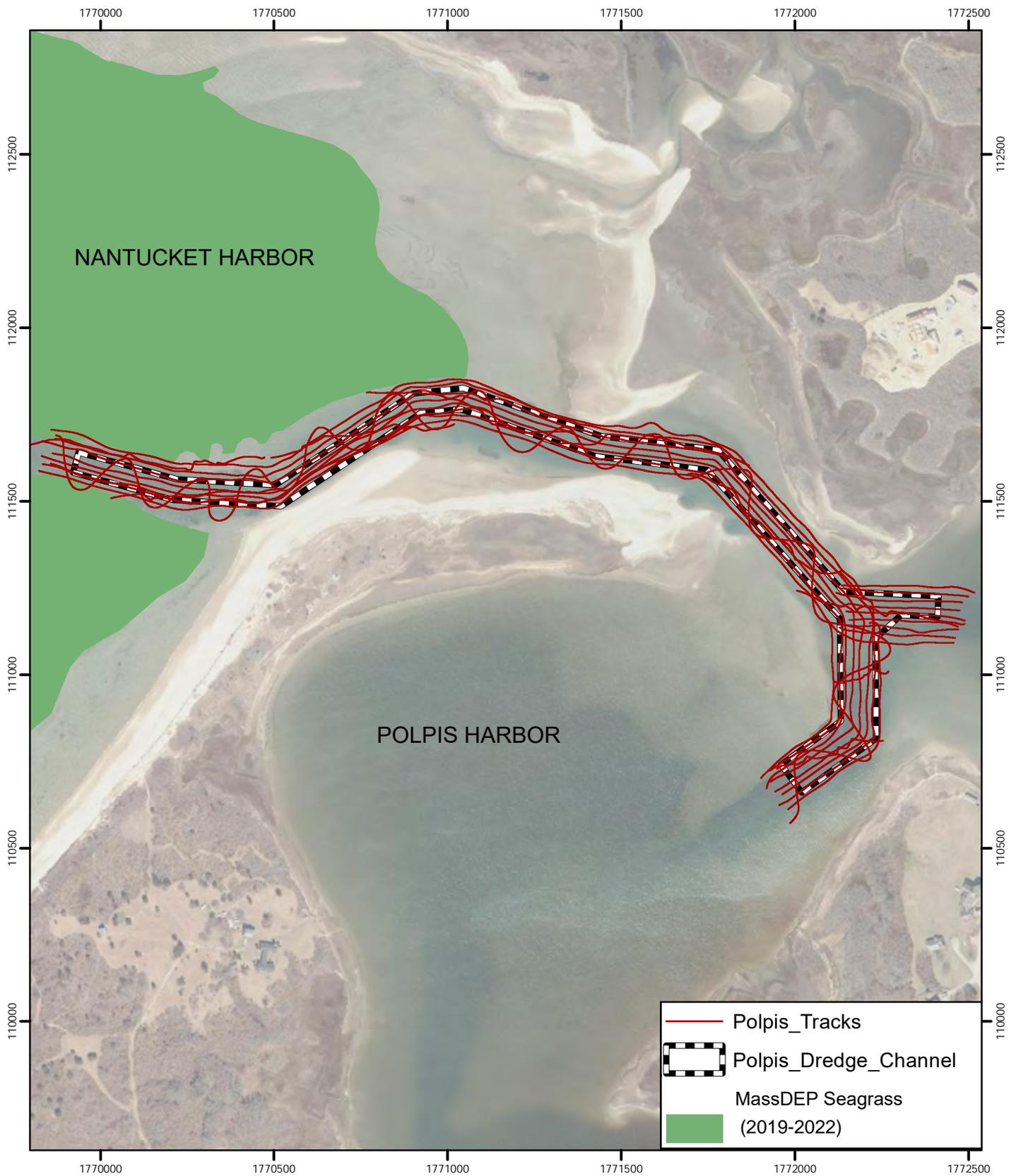
Coordinates: Massachusetts State Plane, Island, NAD83, US Ft.

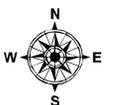
NR = No Recovery

3HC1-B was the second vibracoring attempt at station 3HC1 due to the lack of recovery on the first attempt

Refer to Figure 11 for a plot of Polpis Harbor cores and Figure 12 for Hither Creek cores

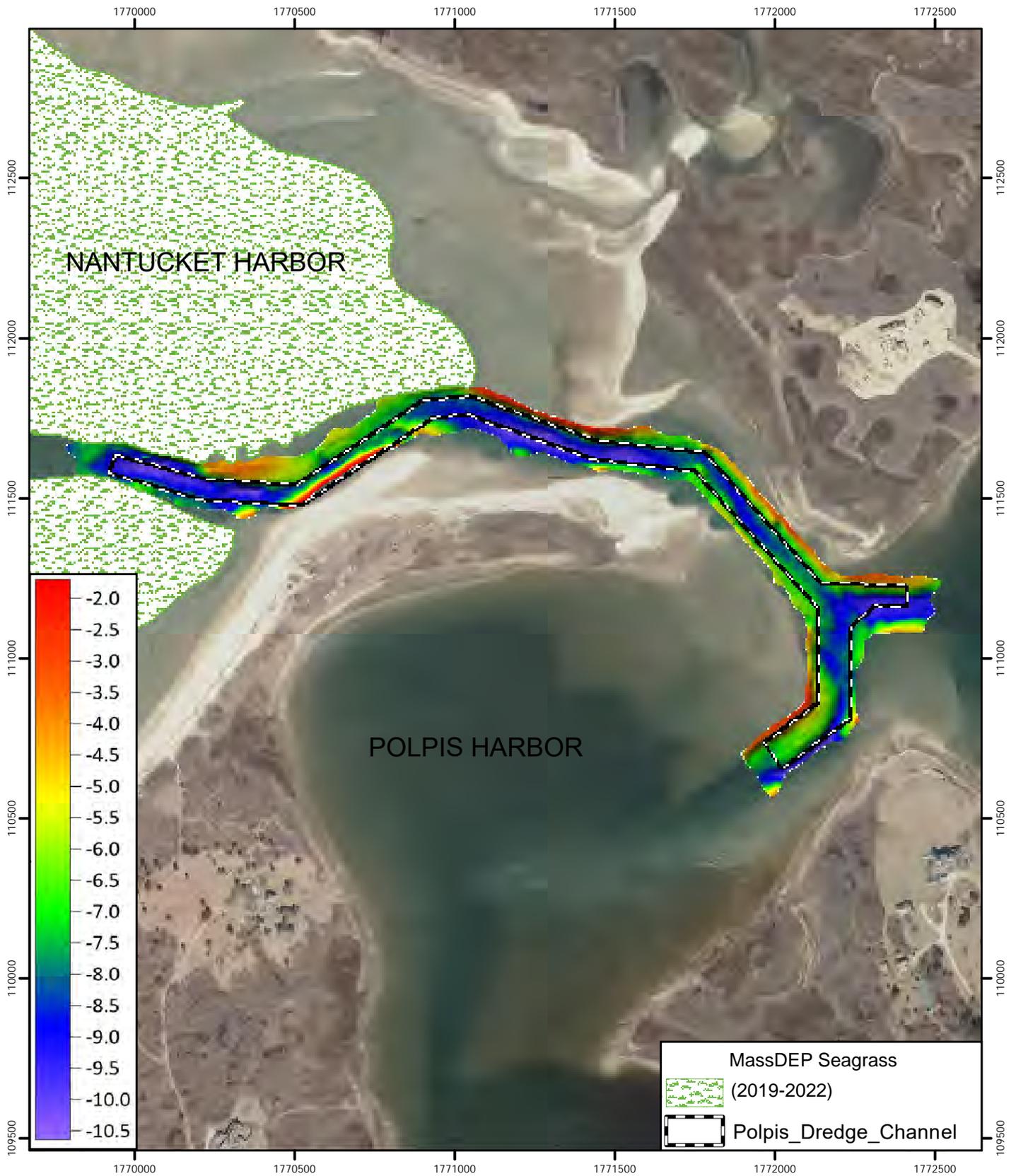
TABLES



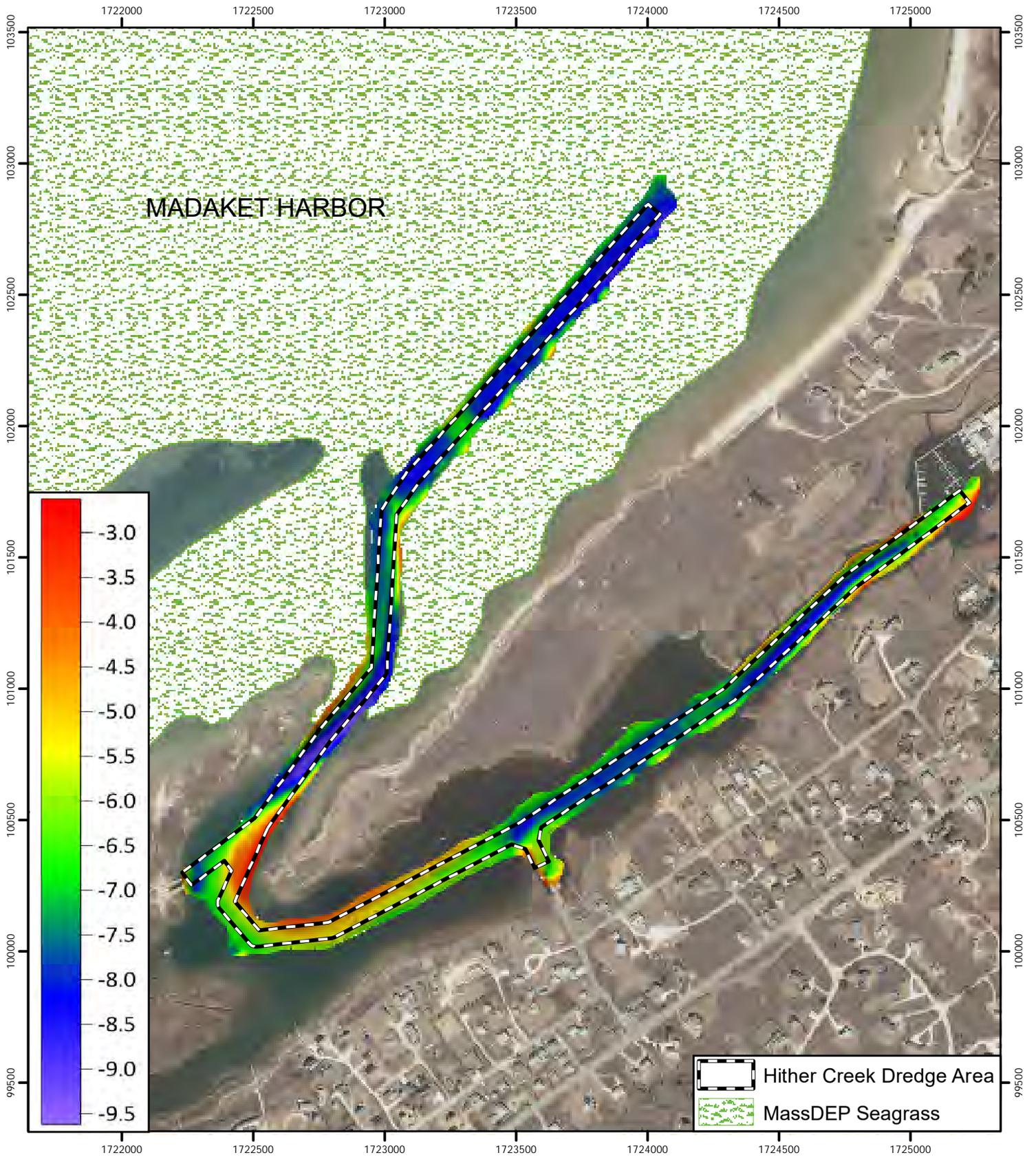
 www.crenvironmental.com	SURVEY TRACKLINES Polpis Harbor Eelgrass Survey Nantucket, Massachusetts	
	NOTES: 1) Survey conducted September 3, 2025 2) Grid MA State Plane (Island) NAD 83 US Ft	Feet 0 200 400 

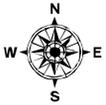


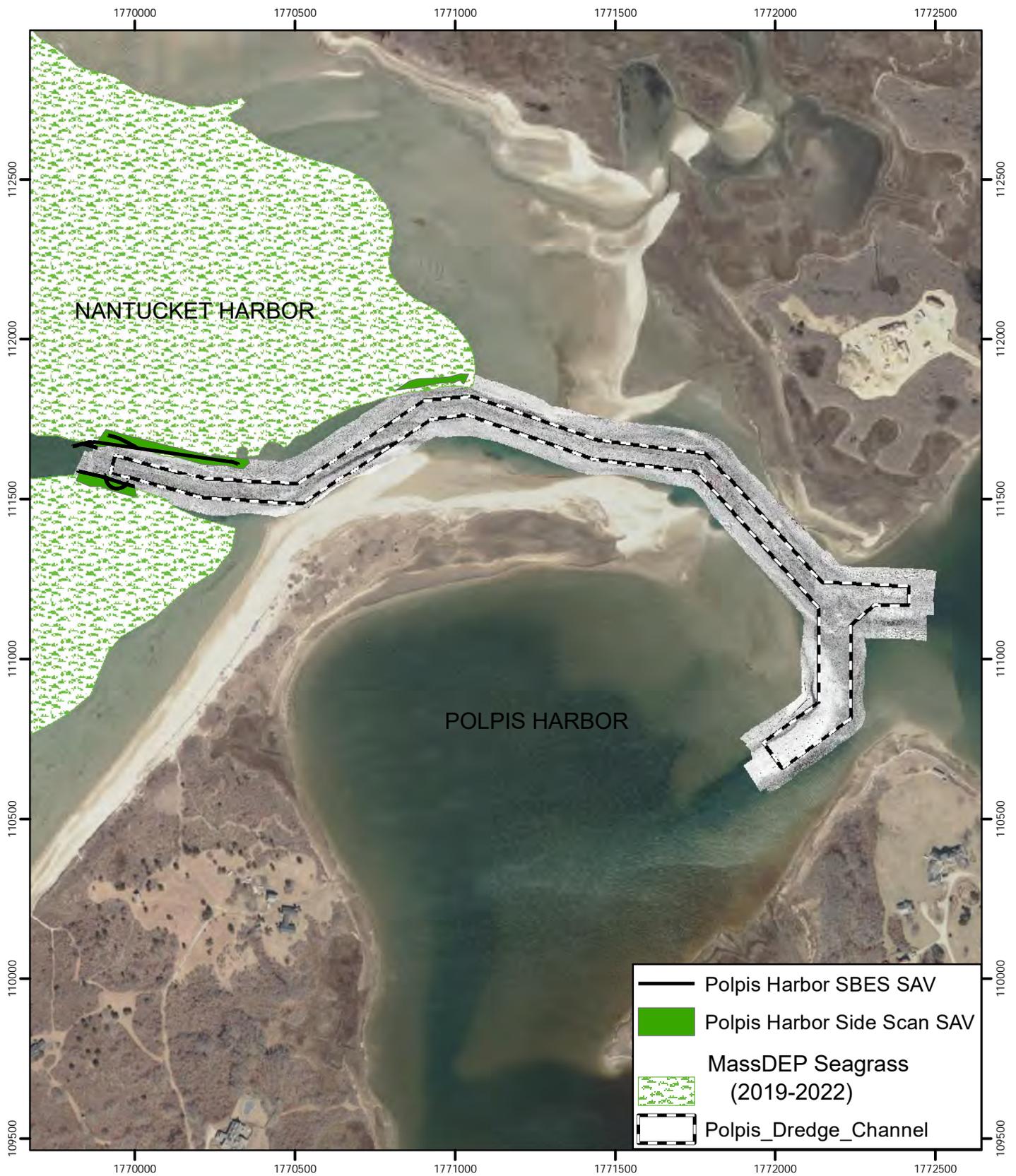
 www.crenvironmental.com	SURVEY TRACKLINES Hither Creek Eelgrass Survey Nantucket, Massachusetts	
	<p>NOTES:</p> <ol style="list-style-type: none"> 1) Survey conducted September 4, 2025 2) Grid MA State Plane (Island) NAD 83 US Ft 	<p>Feet</p> <p>0 200 400</p> 



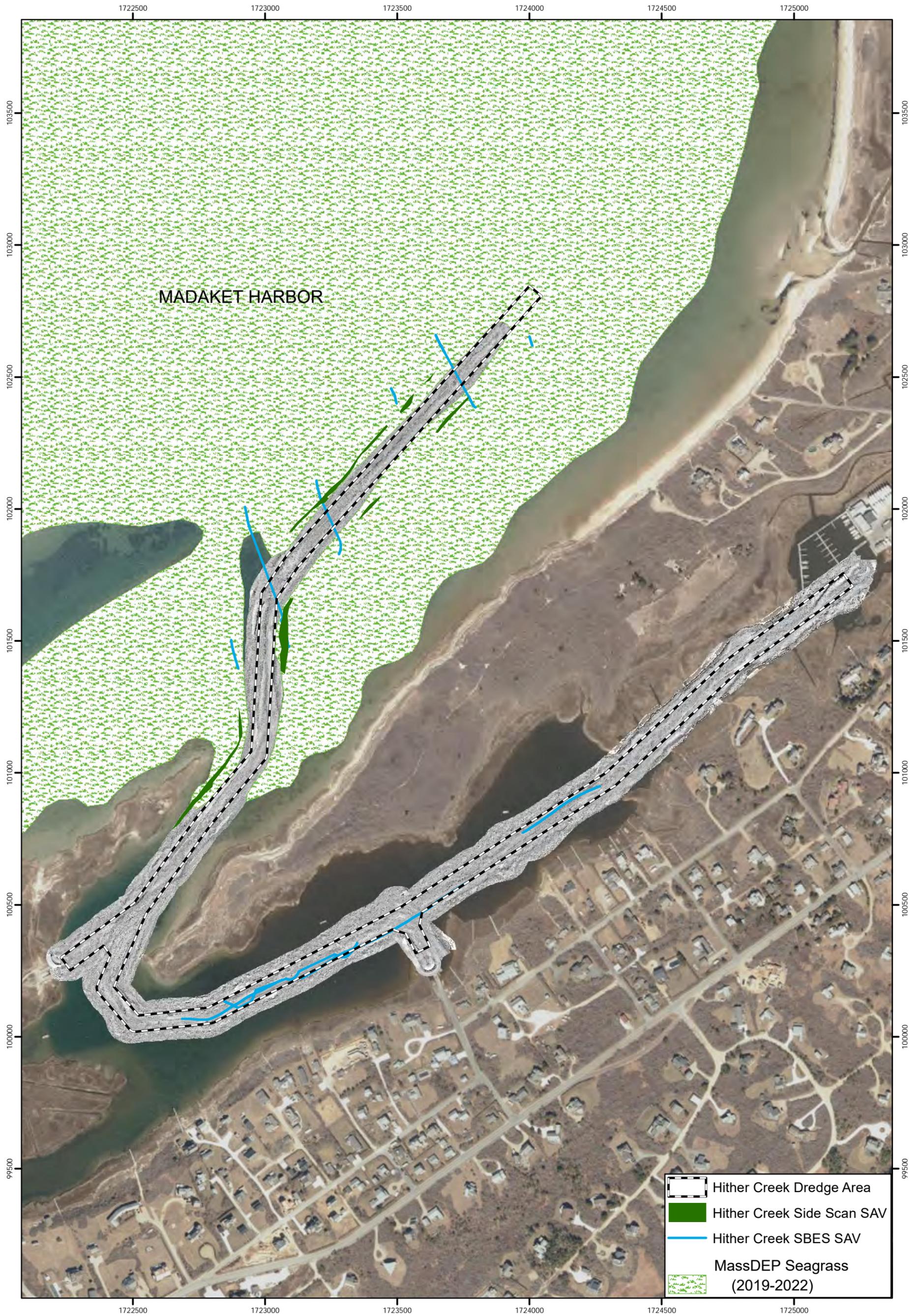
 <p>www.crenvironmental.com</p>	<p>NAVD88 BATHYMETRIC SURFACE Polpis Harbor Nantucket, Massachusetts</p>	
	<p>NOTES:</p> <p>1) Grid MA State Plane (Island) NAD 83 US Ft 2) Bathymetric units in feet.</p>	<p>Feet</p> <p>0 200 400</p> 

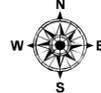


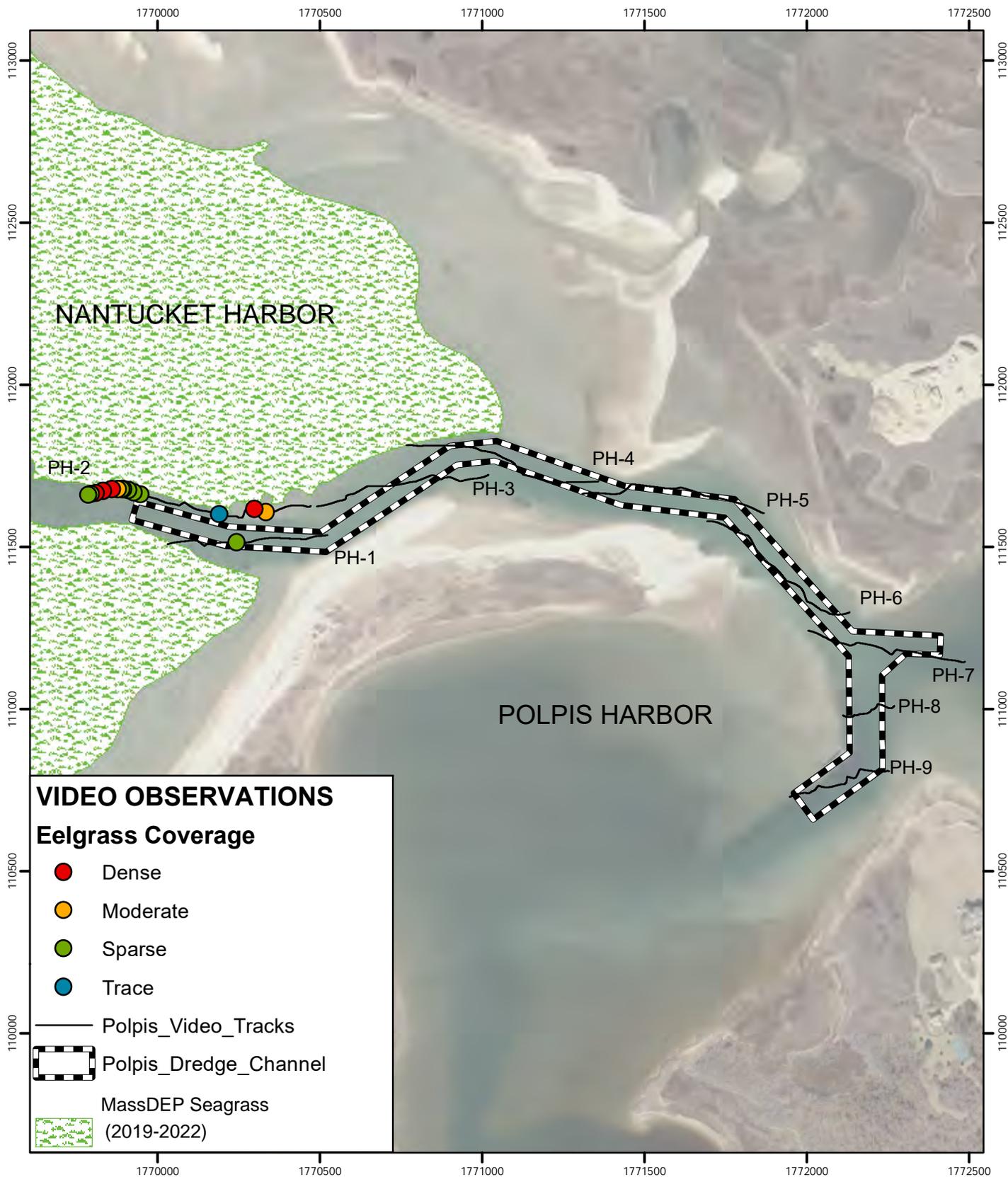
 www.crenvironmental.com	NAVD88 BATHYMETRIC SURFACE Hither Creek Nantucket, Massachusetts		
	NOTES: 1) Grid MA State Plane (Island) NAD 83 US Ft 2) Bathymetric units in feet.	Feet 0 200 400 	



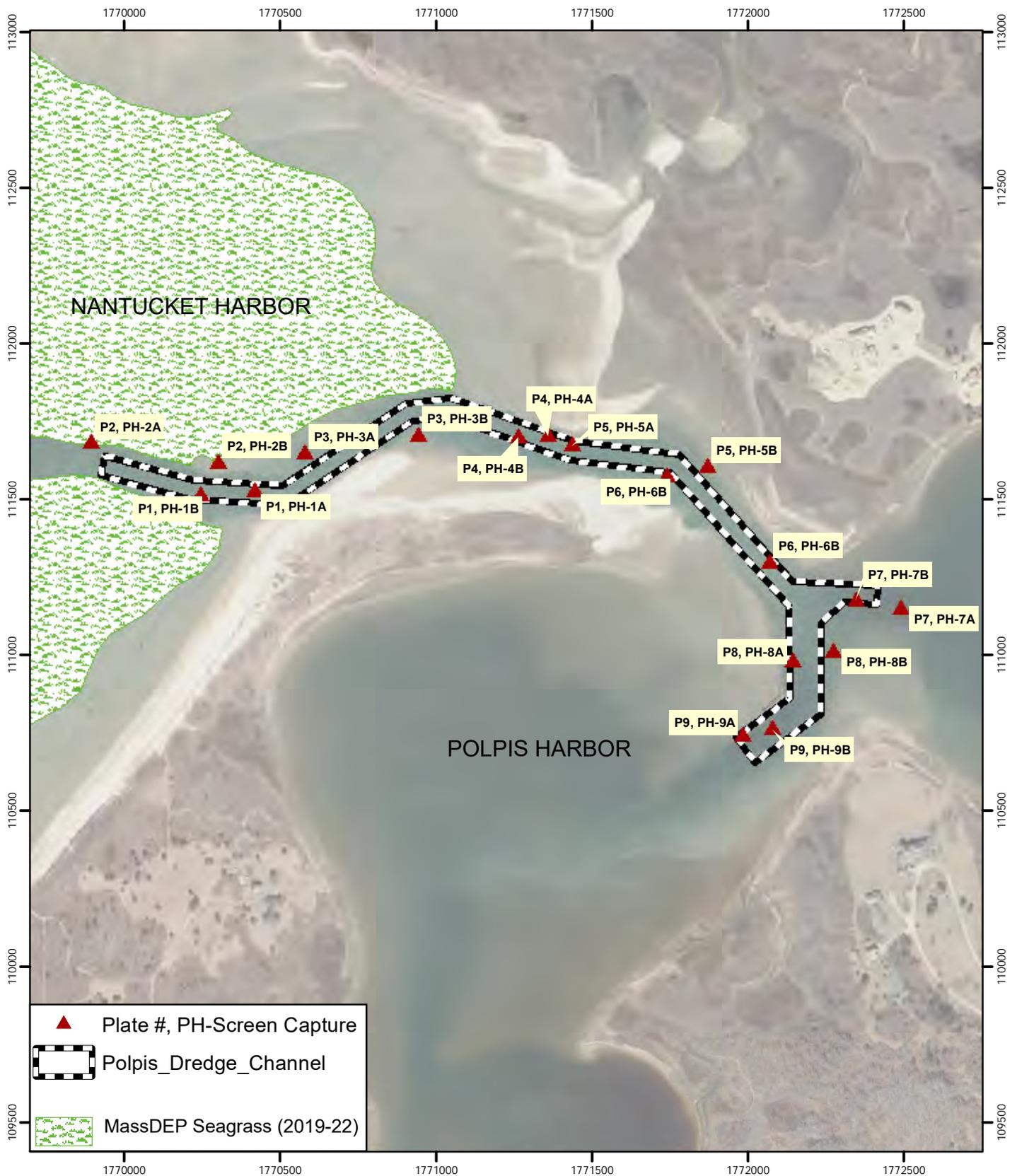
 www.crenvironmental.com	SIDE SCAN AND SINGLE BEAM SONAR SAV SIGNATURES Polpis Harbor Nantucket, Massachusetts		
	NOTES: 1) Grid MA State Plane (Island) NAD 83 US Ft	Feet 0 200 400 	Figure 5



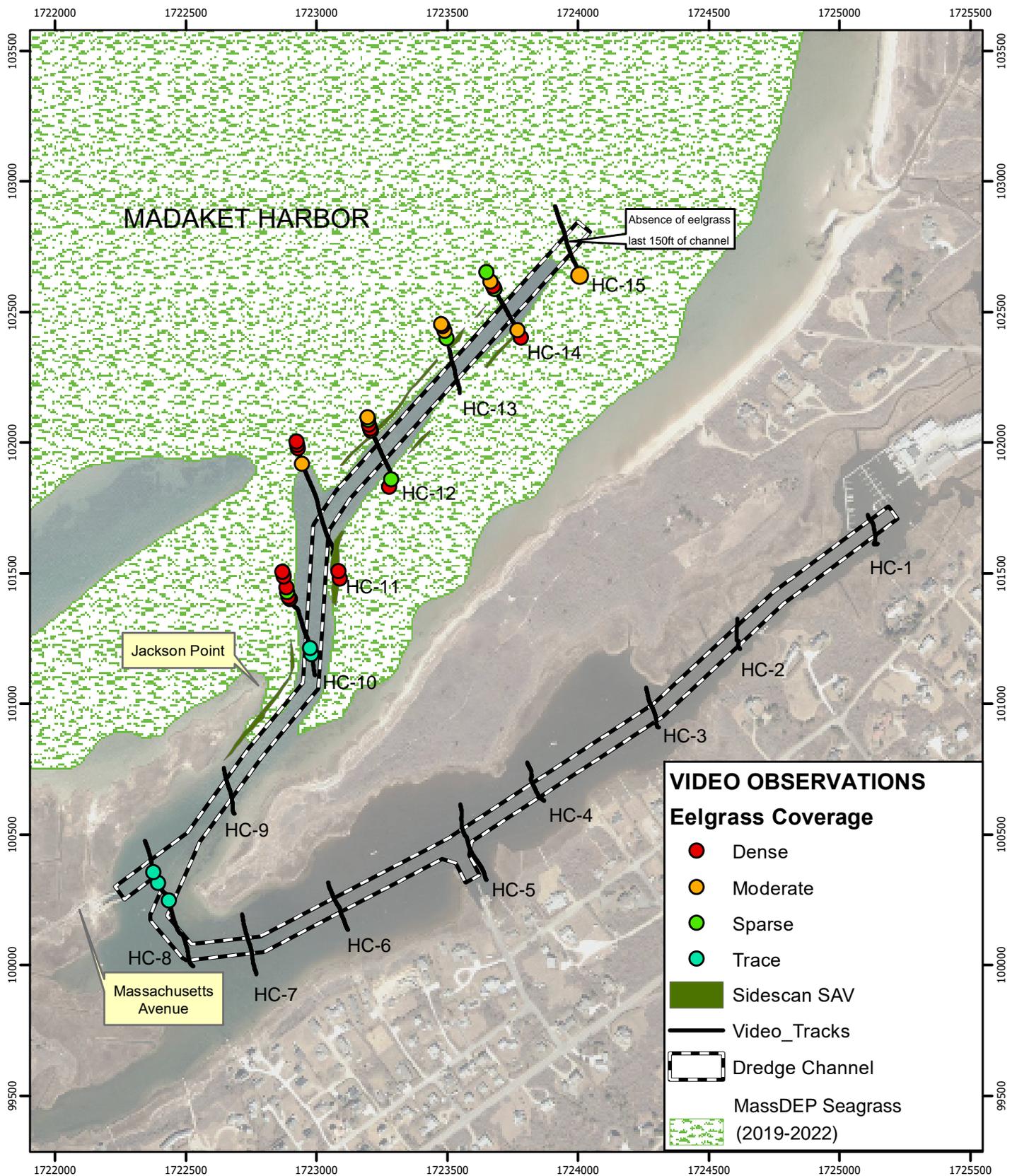
 www.crenvironmental.com	SIDE SCAN AND SINGLE BEAM SONARS SAV SIGNATURES Hither Creek Nantucket, Massachusetts		
	NOTES: 1) Grid MA State Plane (Island) NAD 83 US Ft	Feet 0 200 400 	



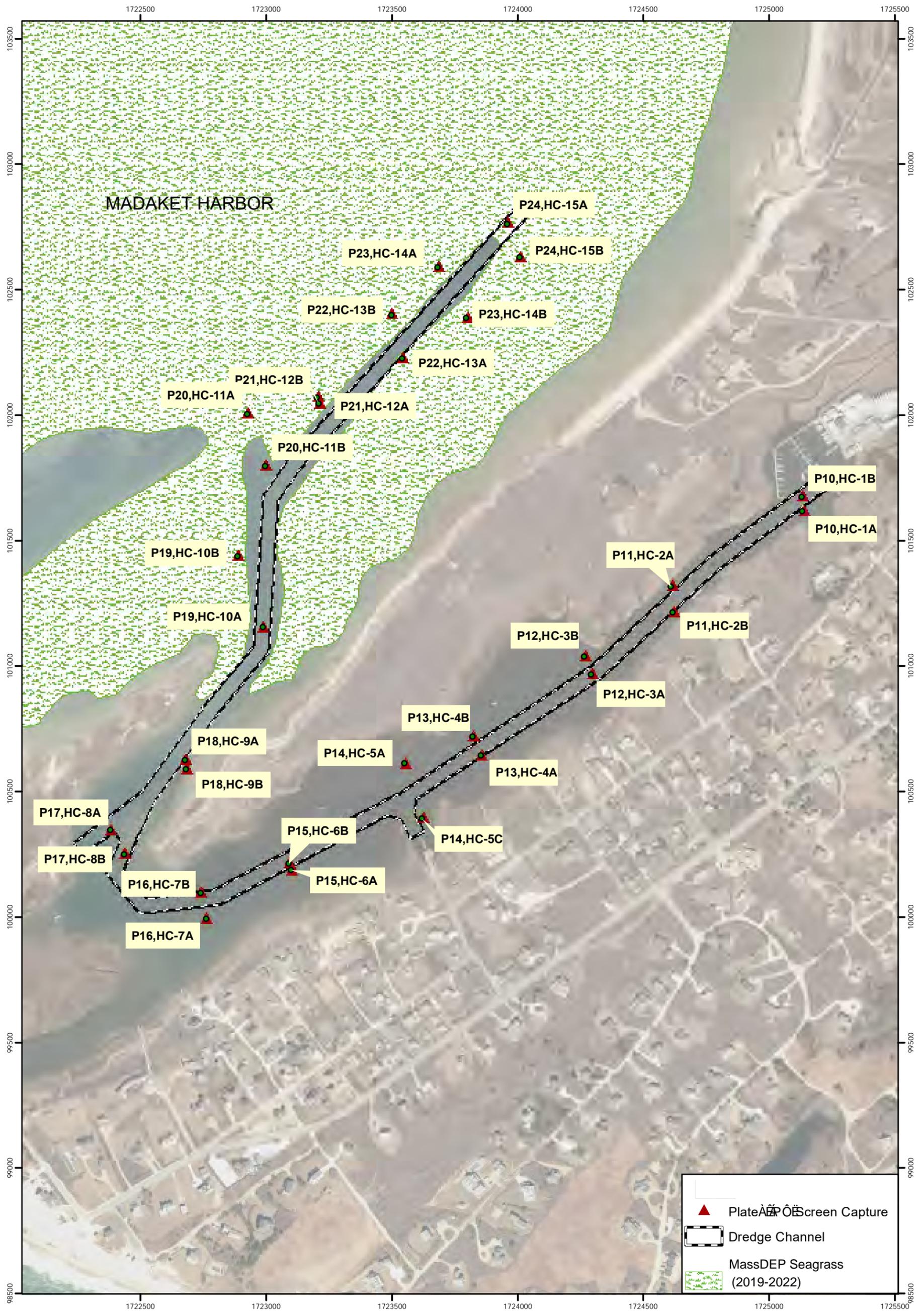
 <p>www.crenvironmental.com</p>	<p>EELGRASS DISTRIBUTION AND COVER Polpis Harbor Eelgrass Survey Nantucket, Massachusetts</p>		
	<p>NOTES:</p> <ol style="list-style-type: none"> Survey conducted September 3, 2025 Grid MA State Plane (Island) NAD 83 US Ft 	<p>Feet</p> <p>0 100 200</p> 	

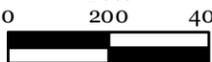


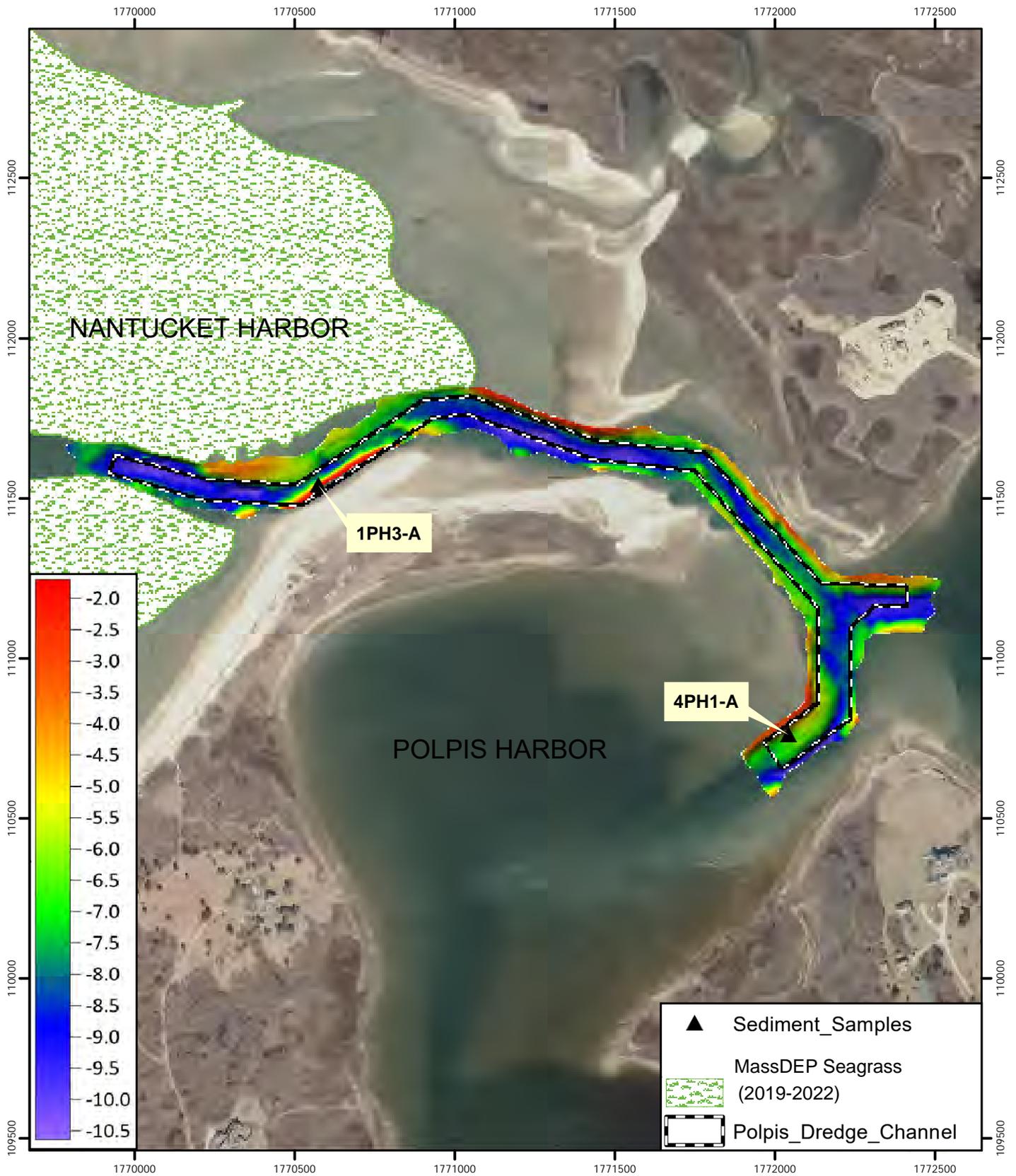
 www.crenvironmental.com	SELECT VIDEO SCREEN CAPTURES Polpis Harbor Channel Survey Nantucket, Massachusetts	
	NOTES: 1) Eelgrass survey conducted September 3, 2025 2) Grid MA State Plane (Island) NAD 83 US Ft	Feet 0 200 400 



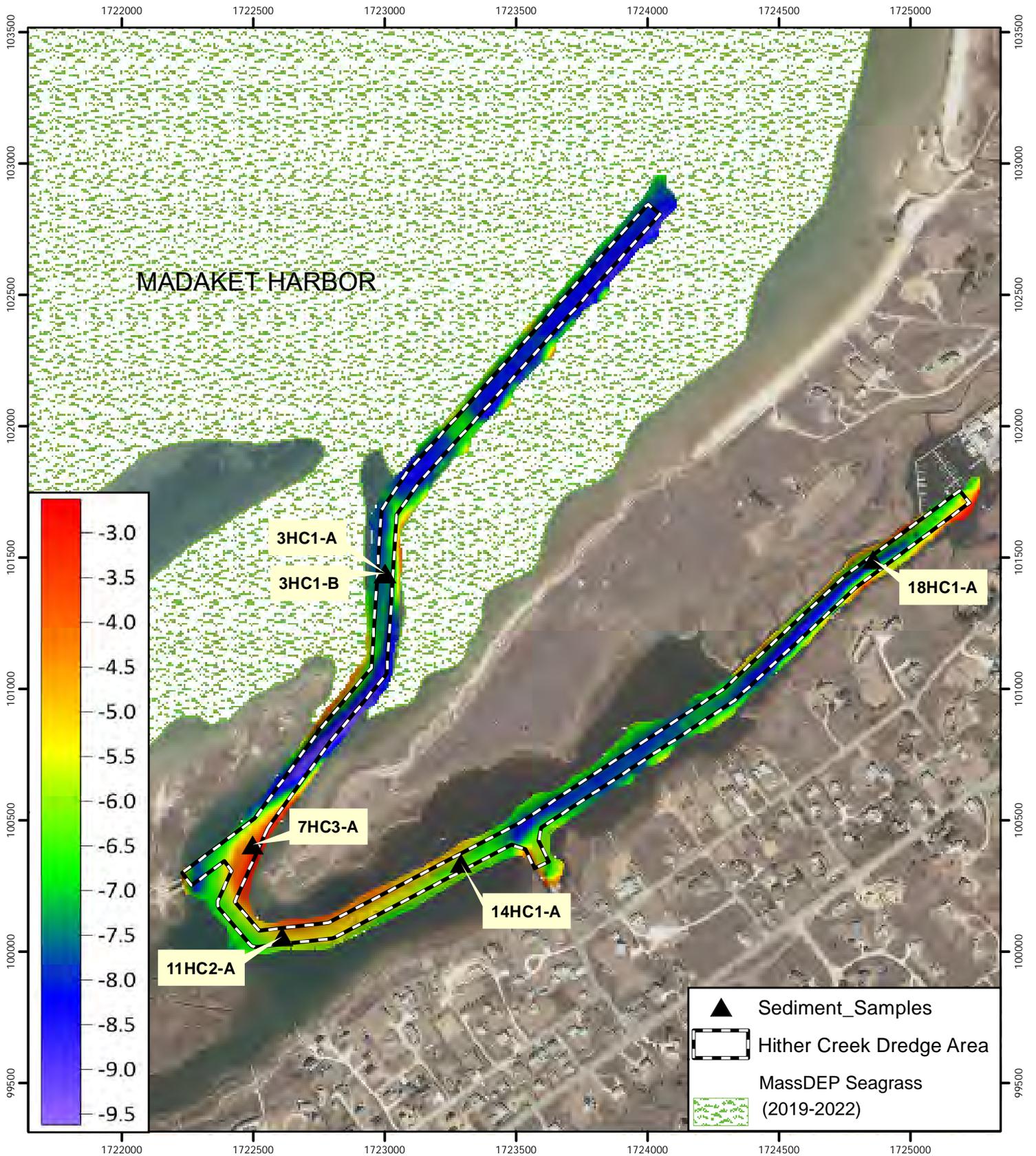
 <p>www.crenvironmental.com</p>	<p>EELGRASS DISTRIBUTION AND COVER Hither Creek Eelgrass Survey Nantucket, Massachusetts</p>		
	<p>NOTES: 1) Survey conducted September 5, 2025 2) Grid MA State Plane (Island) NAD 83 US Ft</p>	<p>Feet 0 200 400</p> 	

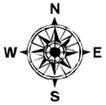


 <p>www.crenvironmental.com</p>	<p>SELECT VIDEO SCREEN CAPTURES Hither Creek Eelgrass Survey Nantucket, Massachusetts</p>	
	<p>NOTES: 1) Survey conducted September 5, 2025 2) Grid MA State Plane (Island) NAD 83 US Ft</p>	<p>0 Feet 400</p> 



 www.crenvironmental.com	SEDIMENT VIBRACORE LOCATIONS & NAVD88 BATHYMETRY Polpis Harbor Nantucket, Massachusetts	
	NOTES: 1) Grid MA State Plane (Island) NAD 83 US Ft 2) Bathymetric units in feet. Nov. 3, 2025 core samples.	Feet 0 200 400 



 www.crenvironmental.com	SEDIMENT VIBRACORE LOCATIONS & NAVD88 BATHYMETRY Hither Creek Nantucket, Massachusetts		
	NOTES: 1) Grid MA State Plane (Island) NAD 83 US Ft 2) Bathymetric units in ft. Nov. 4, 2025 core samples.	Feet 0 200 400 	
			Figure 12

**PLATES of
REPRESENTATIVE BOTTOM SUBSTRATE and BIOTA**

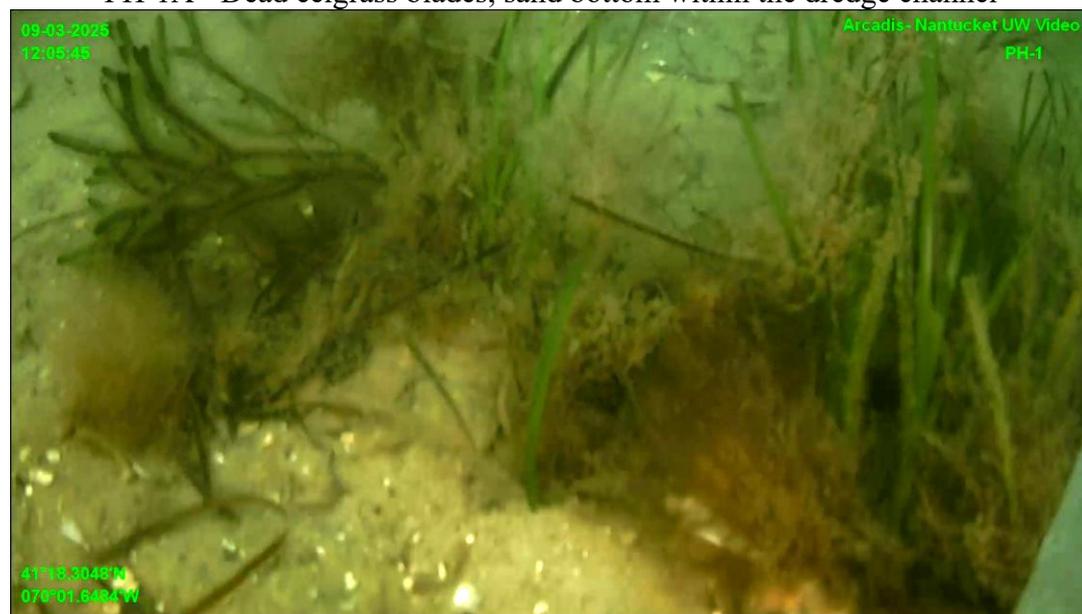
Plates 1-9 Selected Video Screen Captures Polpis Harbor

Plates 10-24 Selected Video Screen Captures Hither Creek

POLPIS HARBOR
VIDEO SCREEN CAPTURES



PH-1A - Dead eelgrass blades, sand bottom within the dredge channel



PH-1B – Sparse eelgrass, branching red algae, dead man’s fingers on sand at the southern edge of the dredge channel

PLATE 1. Video Screen Captures of Bottom Substrate and Biota no eelgrass at Transect PH-1 at the western end of the channel except observation 1B above

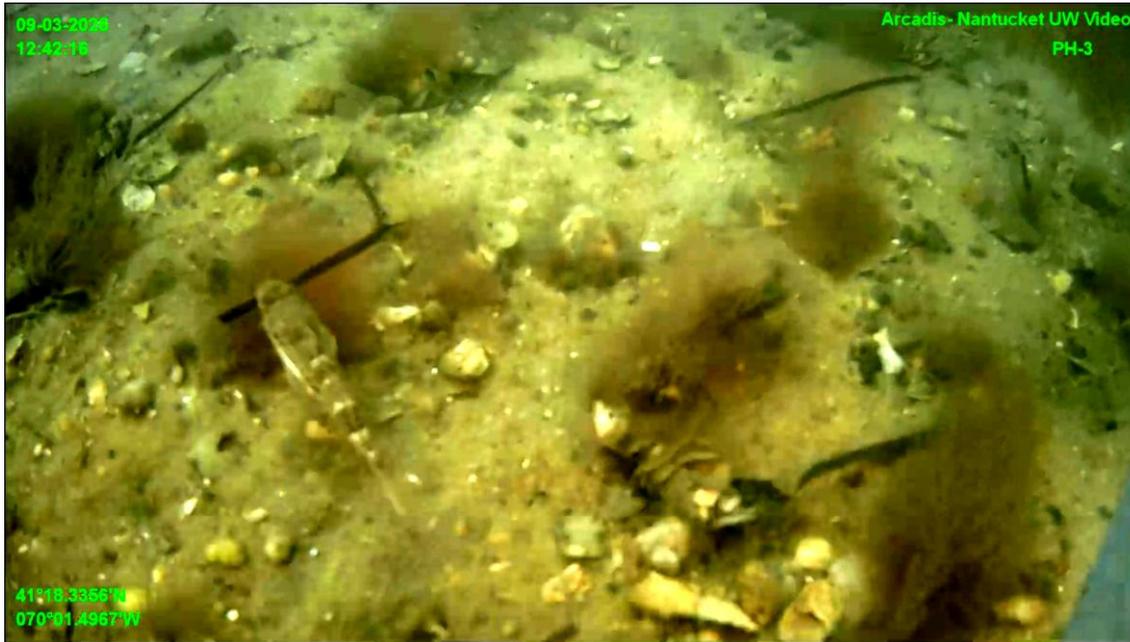


PH-2A - Sparse eelgrass, tufted red algae, sand bottom with shell outside the dredge channel



PH-2B - Dense eelgrass, branching red algae outside the dredge channel

PLATE 2. Video Screen Captures of Bottom Substrate and Biota at Transect PH-2 along northern edge of the channel no eelgrass observed in the channel



PH-3A – Dead eelgrass blades, tufted red algae, juvenile puffer fish outside the dredge channel



PH-3B – Dead man's fingers with epiphytes outside the dredge channel

PLATE 3. Video Screen Captures of Bottom Substrate and Biota at Transect PH-3 no eelgrass observed in the channel



PH-4A Scallop shells



PH-4B – Scallop shells, boring sponge

PLATE 4. Video Screen Captures of Bottom Substrate and Biota at Transect PH-4 no eelgrass observed in the channel

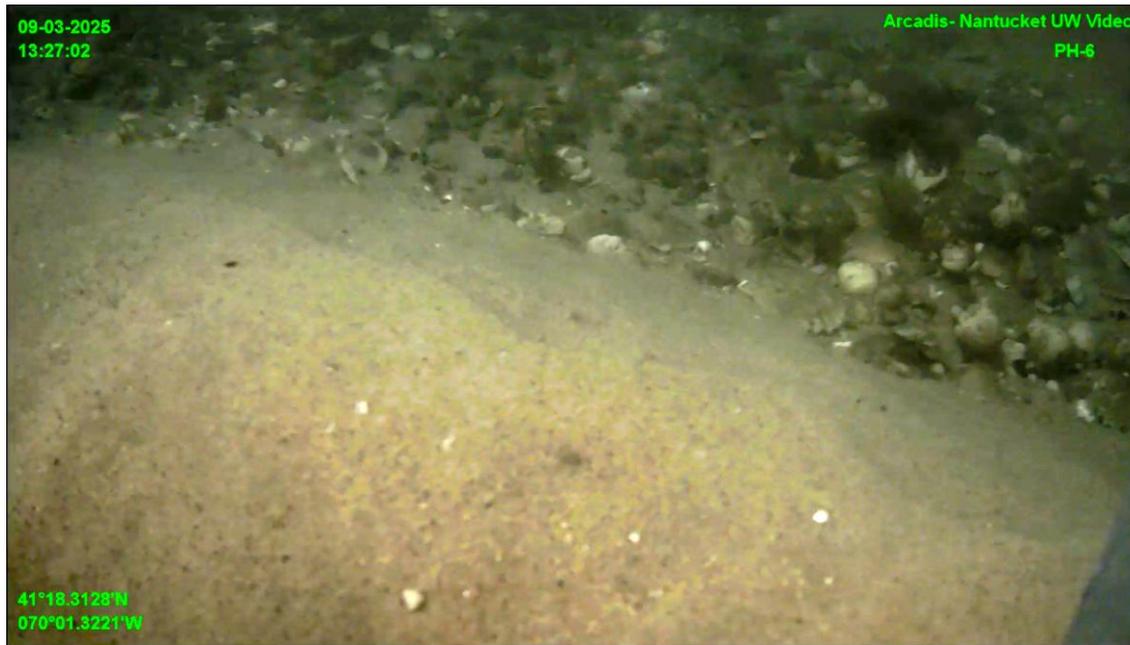


PH-5A – Encrusting bryozoan, dead man’s fingers, shell bottom within the dredge channel



PH-5B – Muddy sand bottom with burrows northern edge of the dredge channel

PLATE 5. Video Screen Captures of Bottom Substrate and Biota at Transect PH-5 no eelgrass observed in the channel



PH-6A – Low amplitude sand wave with pebbles and shell in trough southern edge of the dredge channel



PH-6B – Dead man's fingers with epiphytes, sand bottom at eastern end of the dredge channel

PLATE 6. Video Screen Captures of Bottom Substrate and Biota at Transect PH-6 no eelgrass observed in the channel



PH-7A – Dead eelgrass blades, and decaying tufted red algae outside the eastern end of the dredge channel

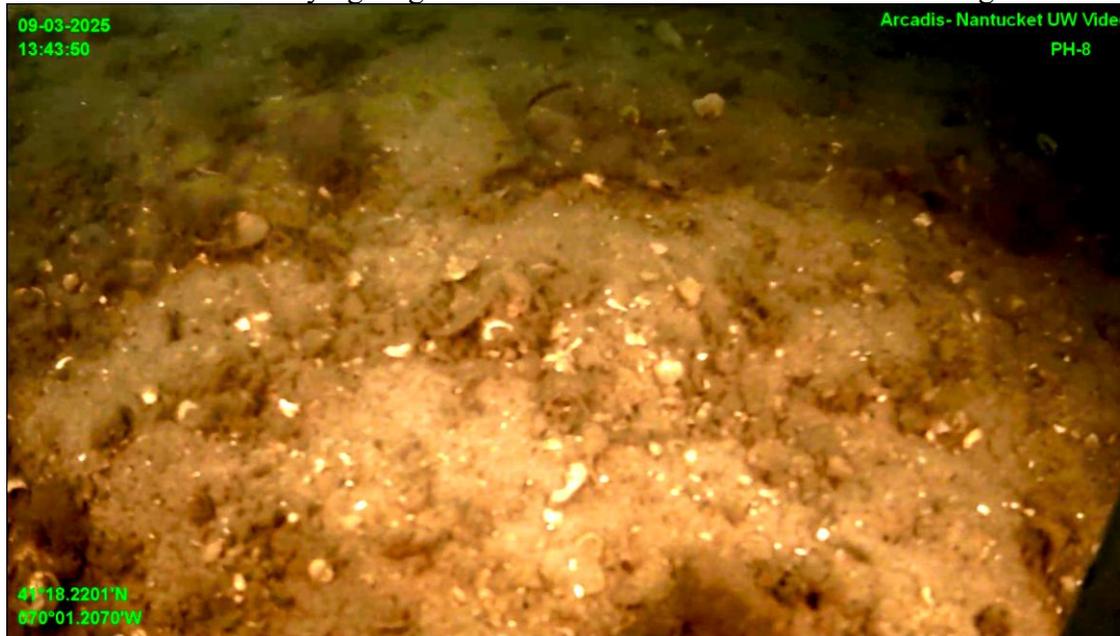


PH-7B – Branching red algae, dead man's fingers southern edge of the dredge channel

PLATE 7. Video Screen Captures of Bottom Substrate and Biota at Transect PH-7 no eelgrass observed in the channel



PH-8A – Mat of decaying eelgrass west side of the eastern end of the dredge channel



PH-8B – Gravelly sand bottom with shell to the east outside the dredge channel

PLATE 8. Video Screen Captures of Bottom Substrate and Biota at Transect PH-8 no eelgrass observed in the channel



PH-9A – Red branching algae, bacterial mat - sign of anoxic conditions



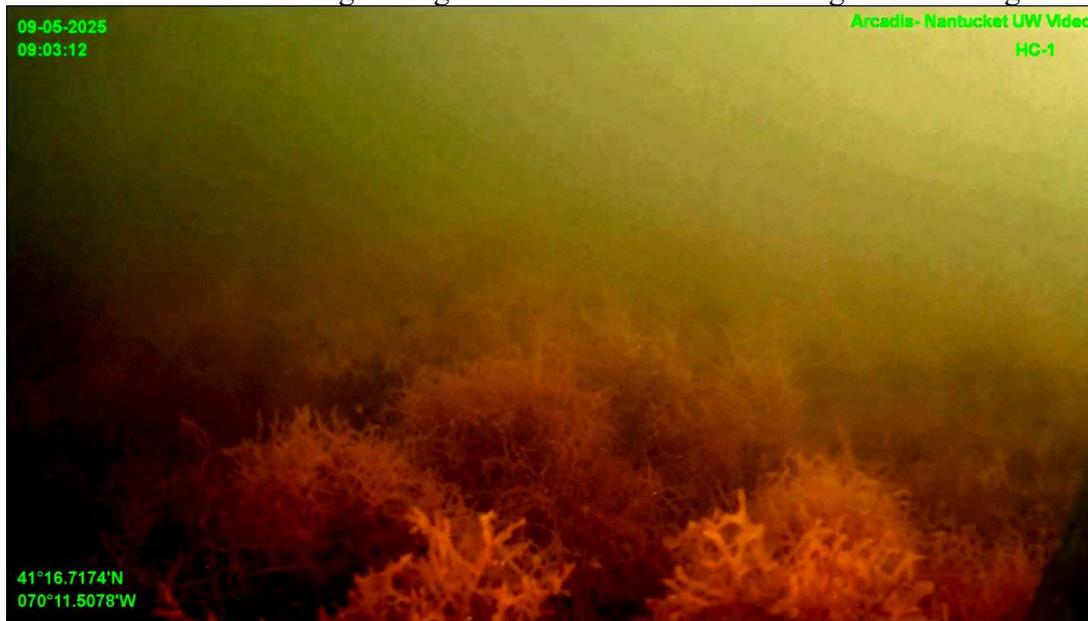
PH-9B – Red branching algae, dead eelgrass blades at the southeastern end of the Polpis Harbor dredge channel

PLATE 9. Video Screen Captures of Bottom Substrate and Biota at Transect PH-9 no eelgrass observed in the channel

HITHER CREEK
VIDEO SCREEN CAPTURES

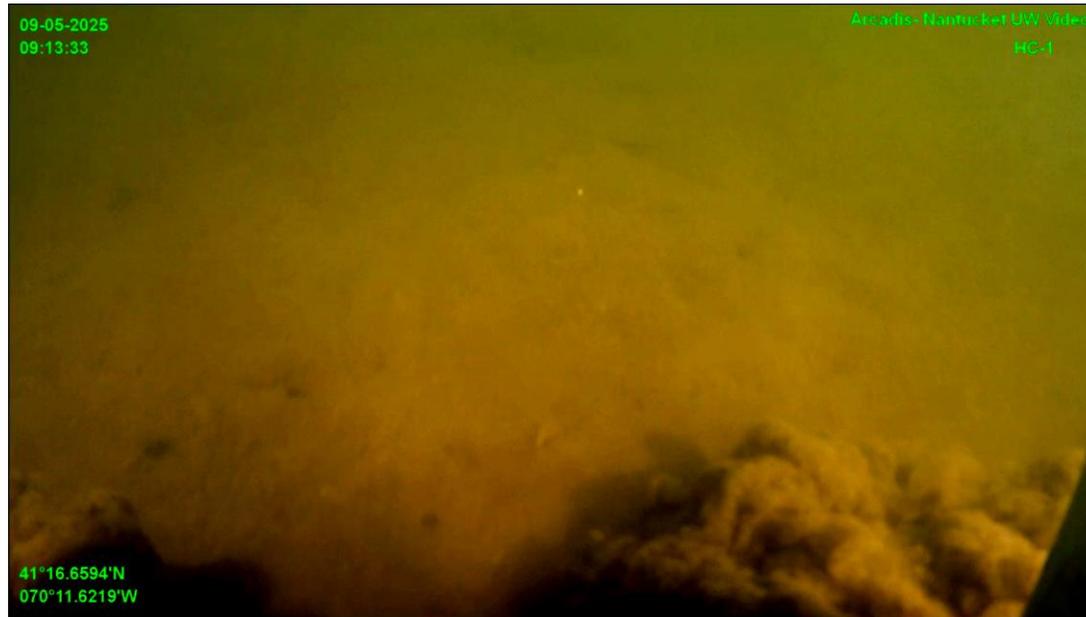


HC-1A – Abundant branching red algae and sea lettuce southern edge of the dredge channel



HC-1B – Abundant branching red algae within the dredge channel

**PLATE 10. Video Screen Captures of Bottom Substrate and Biota at Transect HC-1 at the eastern end of Hither Creek.
No eelgrass was observed**

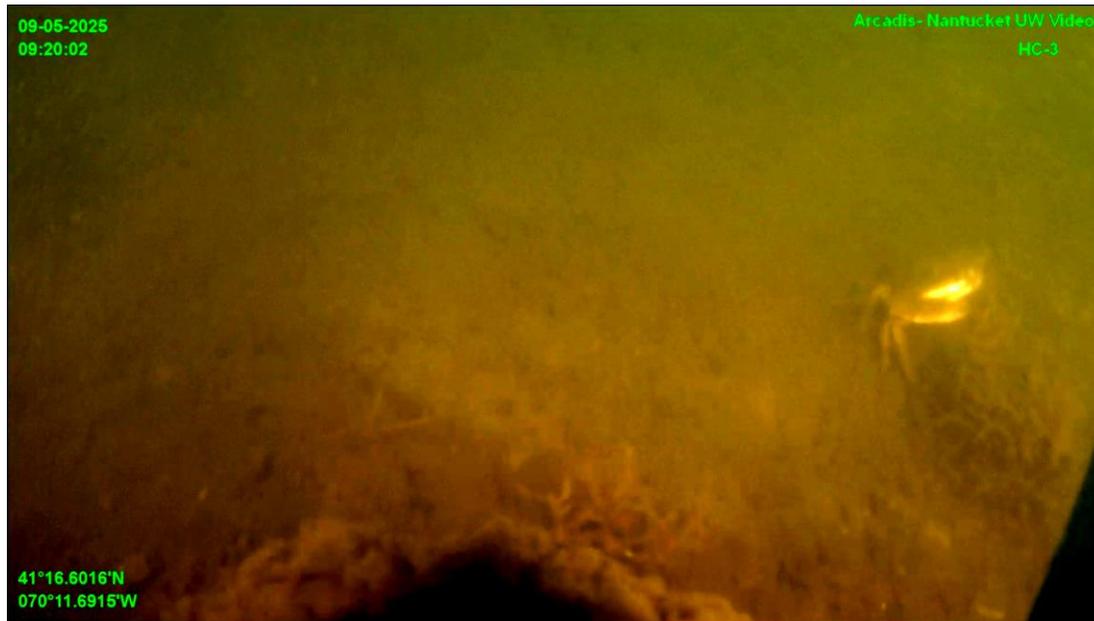


HC-2A – Silty mud bottom with burrows and amphipod tubes northern edge of the dredge channel

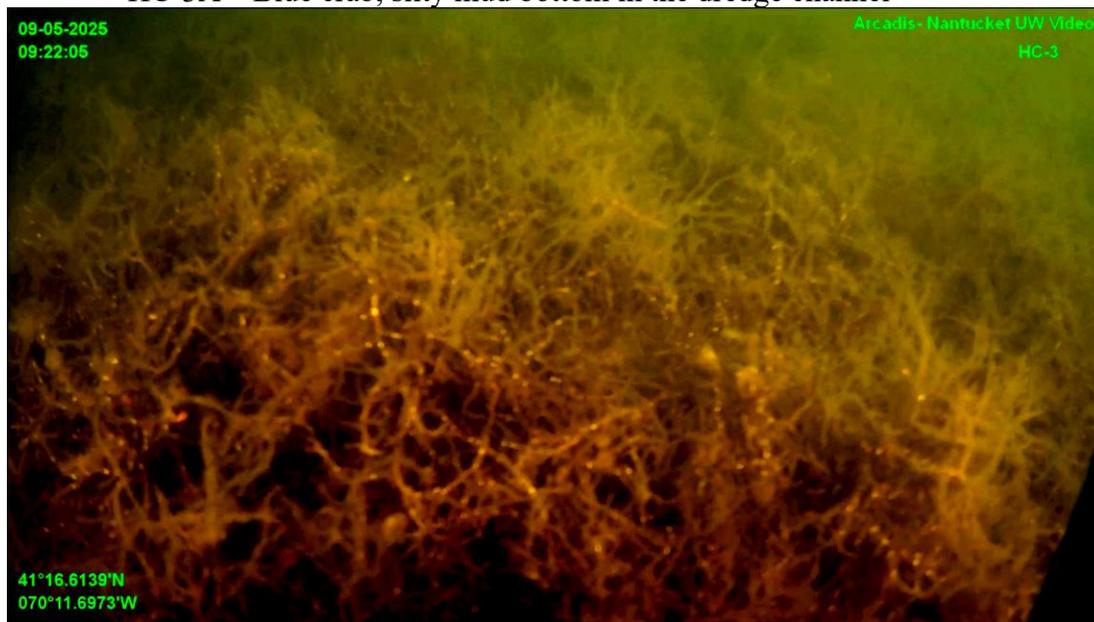


HC-2B – Muddy sand, amphipod tubes southern edge of the dredge channel

PLATE 11. Video Screen Captures of Bottom Substrate and Biota at Transect HC-2. No eelgrass was observed.



HC-3A – Blue crab, silty mud bottom in the dredge channel

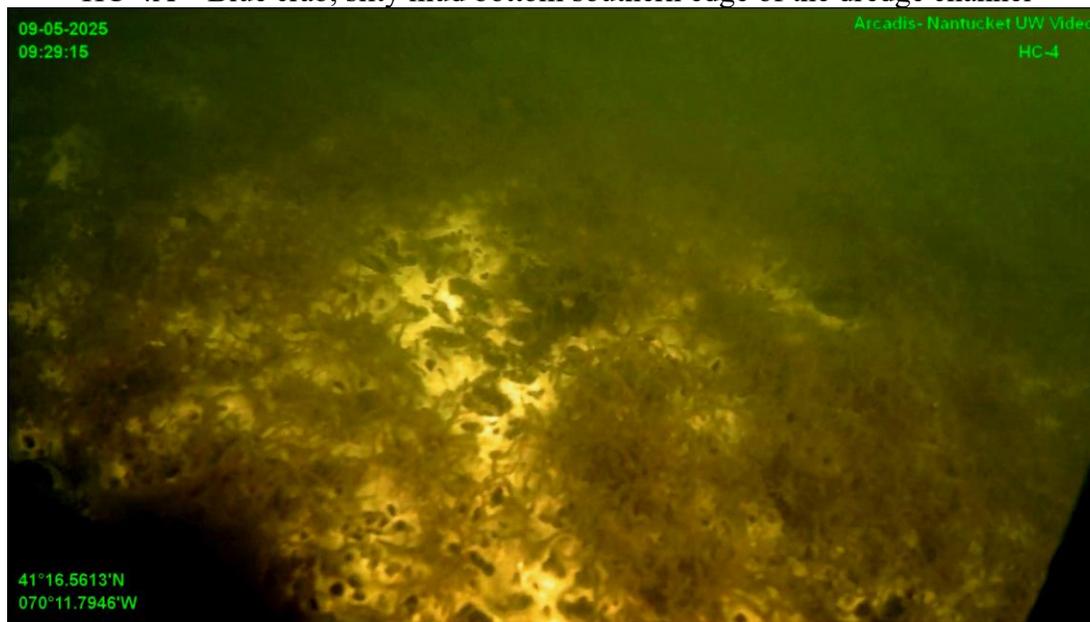


HC-3C – Abundant branching red algae

PLATE 12. Video Screen Captures of Bottom Substrate and Biota at Transect HC-3. No eelgrass was observed on the transect.

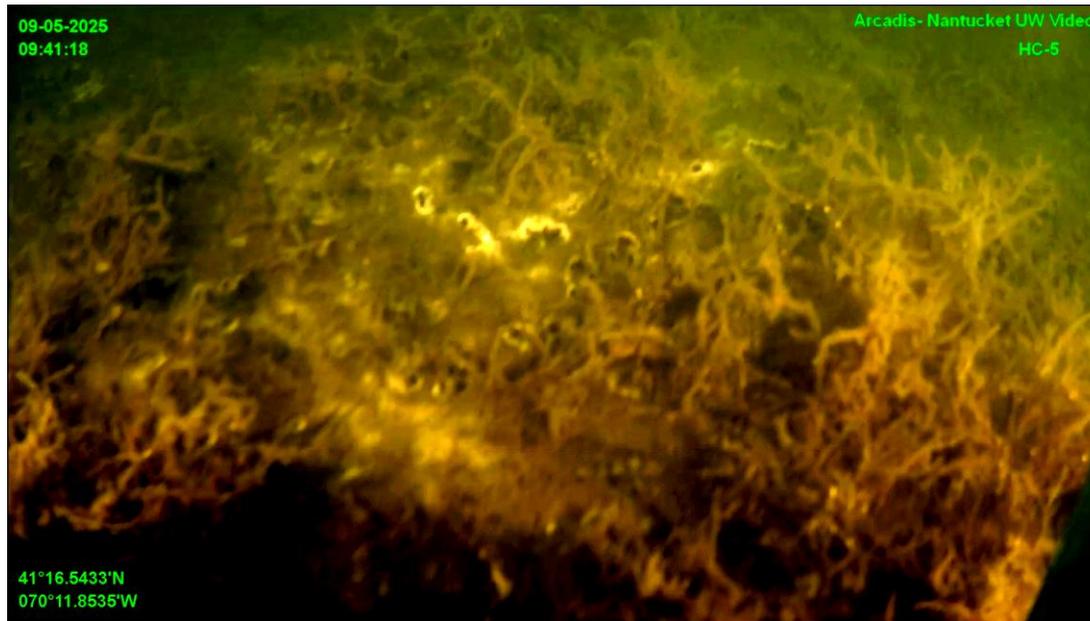


HC-4A – Blue crab, silty mud bottom southern edge of the dredge channel

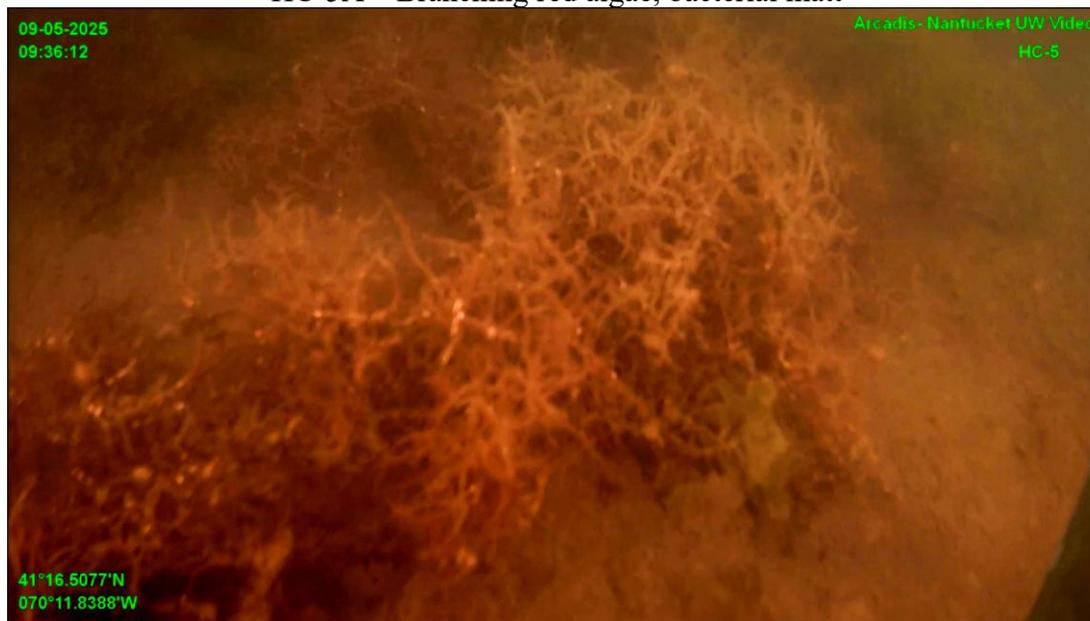


HC-4B – Branching algae, bacterial mat northern edge of the dredge channel

PLATE 13. Video Screen Captures of Bottom Substrate and Biota at Transect HC-4 . No eelgrass was observed.



HC-5A – Branching red algae, bacterial mat



HC-5B – Branching red algae, silty mud bottom edge of the dredge channel

PLATE 14. Video Screen Captures of Bottom Substrate and Biota at Transect HC-5. No eelgrass was observed on the transect.

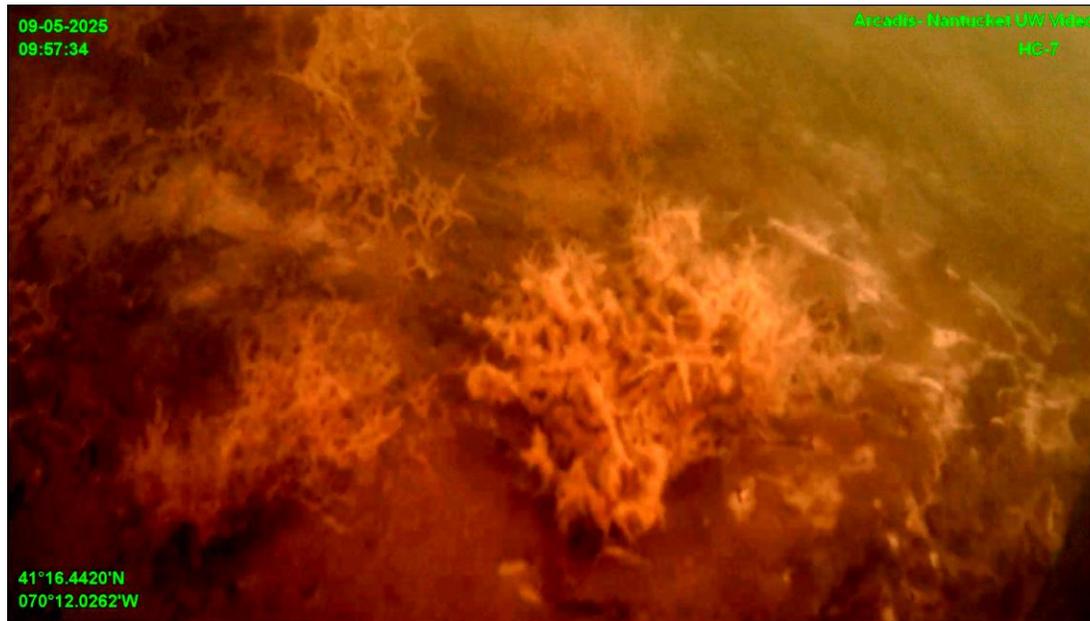


HC-6A – Muddy silt bottom with large burrows southern edge of the dredge channel

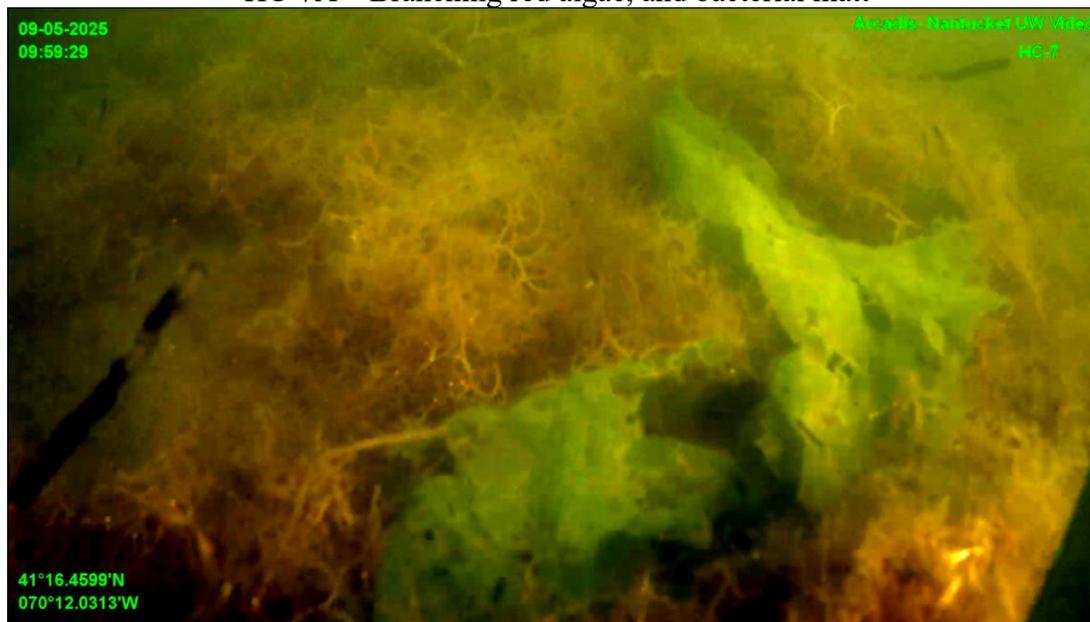


HC-6B – Abundant branching red algae southern edge of the dredge channel

PLATE 15. Video Screen Captures of Bottom Substrate and Biota at Transect HC-6. No eelgrass was observed on the transect.



HC-7A – Branching red algae, and bacterial matt

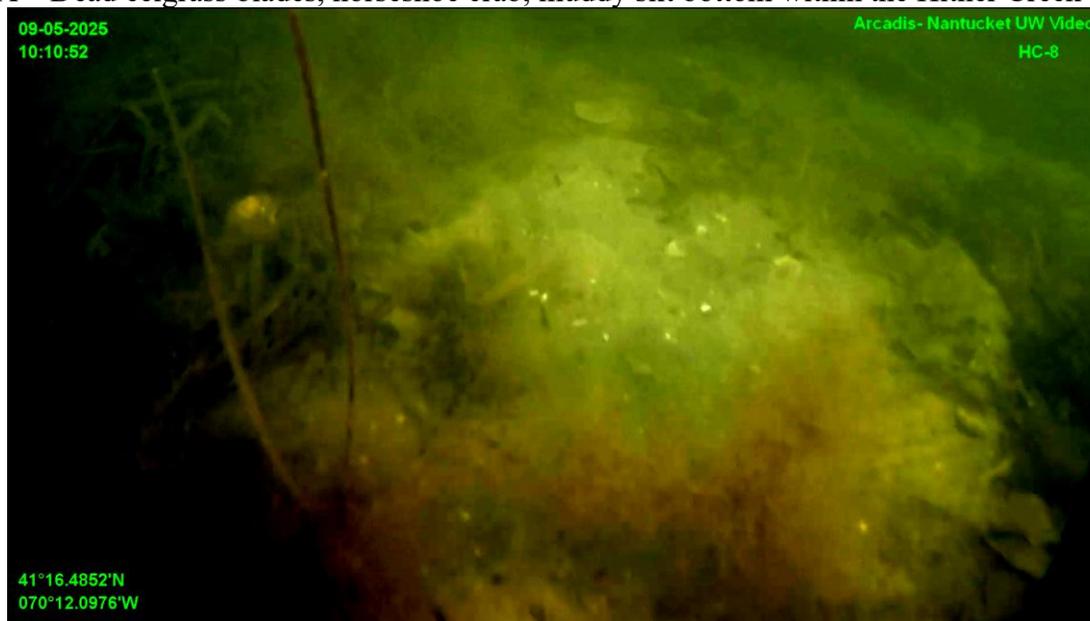


HC-7B – Abundant branching red algae and sea lettuce

PLATE 16. Video Screen Captures of Bottom Substrate and Biota at Transect HC-7. No eelgrass was observed.



HC-8A – Dead eelgrass blades, horseshoe crab, muddy silt bottom within the Hither Creek channel



HC-8B - Trace eelgrass blades and algae on a muddy sand bottom within the Hither Creek channel

Plate 17. Video Screen Captures of Bottom Substrate and Biota at HC-7. A few stray blades of what appeared to be rooted eelgrass were observed. Nothing resembling a patch or bed.



HC-9C – Mat of dead and decaying eelgrass and macroalgae along the southeastern edge of the dredge channel.



HC-9B – Blue crab, tufted red algae, muddy sand bottom just outside the dredge channel

Plate 18. Video Screen Captures of Bottom Substrate and Biota at Transect HC-9. No eelgrass was observed on the transect.



HC-10A – Trace eelgrass within the dredge channel



HC-10B - Sparse eelgrass on sandy bottom in MassDEP mapped eelgrass west of the dredge channel

Plate 19. Video Screen Captures of Bottom Substrate and Biota at Transect HC-10. A few blades observed within the Hither Creek channel.



HC-11A – Dense eelgrass with epiphytic barnacles about 200 feet north of the dredge channel in the area of MassDEP mapped eelgrass.



HC-11B – Dead eelgrass blades, bacterial mat just north of the dredge channel

Plate 20. Video Screen Captures of Bottom Substrate and Biota at Transect HC-11. No eelgrass was observed in the dredge channel.



HC-12A - Dense eelgrass, branching red algae northwest of the dredge channel in the area of MassDEP mapped eelgrass.

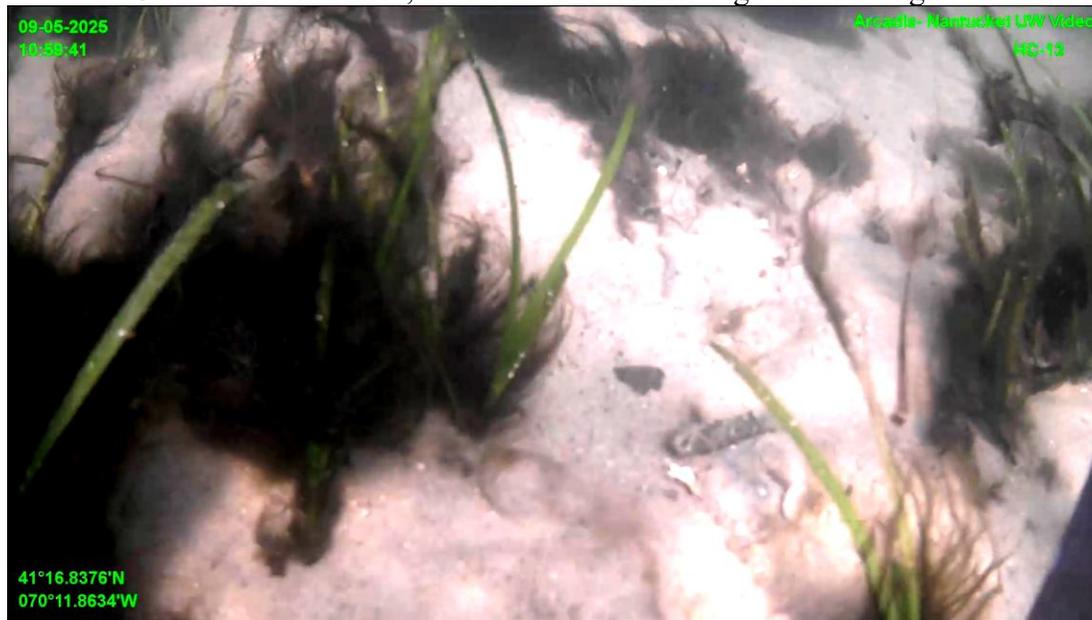


HC-12B – Hermit crab, sand bottom proximate to HC-12A outside the dredge channel.

Plate 21. Video Screen Captures of Bottom Substrate and Biota at Transect HC-12. No eelgrass was observed in the dredge channel.

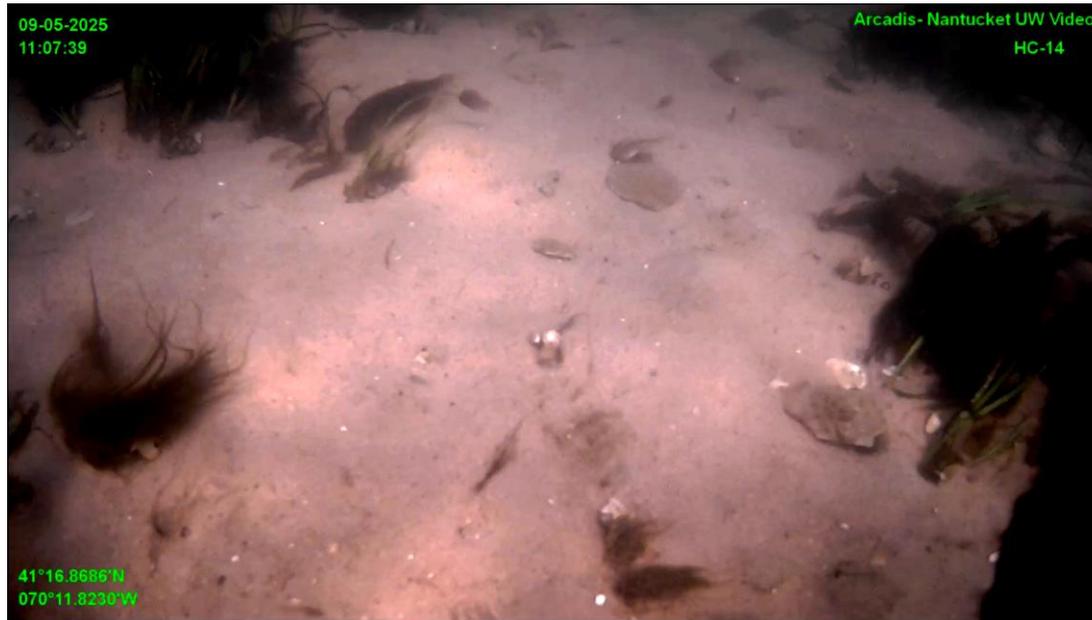


HC-13A – Horseshoe crab, sand bottom southern edge of the dredge channel



HC-13B - Sparse eelgrass, branching red algae, sand bottom north of the dredge channel in the area of MassDEP mapped eelgrass.

PLATE 22. Video Screen Captures of Bottom Substrate and Biota at Transect HC-13. No eelgrass was observed in the transect.



HC-14A – Sparse eelgrass, branching red algae, sandy substrate northwest of the channel in the area of Mass DEP mapped eelgrass



HC-14B - Dense eelgrass with barnacles, and branching red algae southeast of Hither Creek in the area of Mass DEP mapped eelgrass

Plate 23. Video Screen Captures of Bottom Substrate and Biota at Transect HC-14. No eelgrass was observed on the transect.



HC-15A – Mat of dead and decaying eelgrass at the Madaket Harbor end of the Hither Creek channel. Although mapped no live eelgrass was observed.



HC-15B - Moderate eelgrass with barnacles, branching red algae southeast of the channel in the area of MassDEP mapped eelgrass.

Plate 24. Video Screen Captures of Bottom Substrate and Biota at Transect HC-15. No live eelgrass observed in the Hither Creek channel.

Attachment I

NHESP Letter



MASSWILDLIFE

DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
[MASS.GOV/MASSWILDLIFE](https://www.mass.gov/masswildlife)

July 15, 2025

Kimberly Rogers
Arcadis U.S., Inc.
233 Broadway
New York, NY 10279

RE: Project Location: Polpis Harbor and Hither Creek
Town: Nantucket
Heritage Hub Form ID: IR-95014

NHESP Tracking No.: -

To Whom It May Concern:

Thank you for contacting the Natural Heritage and Endangered Species Program (NHESP) of the MA Division of Fisheries & Wildlife (the "Division") for information regarding state-listed species in the vicinity of the above referenced site. Based on the information provided, this project site or a portion thereof is located **within** the current Massachusetts Natural Heritage Atlas. The following state-listed species are mapped for both Priority Habitat (PH) and Estimated Habitat (EH), as indicated in the following table:

<u>Scientific Name</u>	<u>Common Name</u>	<u>Taxonomic Group</u>	<u>State Status</u>	<u>EH</u>	<u>PH</u>
<i>Sterna dougallii</i>	Roseate Tern	Bird	Endangered	1365	888
<i>Sterna hirundo</i>	Common Tern	Bird	Special Concern	1365	888
<i>Sternula antillarum</i>	Least Tern	Bird	Special Concern	1365	888
<i>Charadrius melodus</i>	Piping Plover	Bird	Threatened	1365	888

The species listed above are protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the Massachusetts Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.00). Fact sheets for most state-listed species can be found on our website (www.mass.gov/nhesp).

Please note that projects and activities located within Priority and/or Estimated Habitat must be reviewed by the Division for compliance with the state-listed species protection provisions of MESA (321 CMR 10.00) and/or the WPA (310 CMR 10.00).

MASSWILDLIFE

Wetlands Protection Act (WPA)

If the project site is within Estimated Habitat and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the Division so that it is received at the same time as the local conservation commission. If the Division determines that the proposed project will adversely affect the actual Resource Area habitat of state-protected wildlife, then the proposed project may not be permitted (310 CMR 10.37, 10.58(4)(b) & 10.59). In such a case, the project proponent may request a consultation with the Division to discuss potential project design modifications that would avoid adverse effects to state-listed wildlife habitat.

A streamlined joint MESA/WPA review process is available. When filing an NOI, the applicant may file concurrently under the MESA and qualify for a 30-day streamlined joint review. Please visit our website for filing instructions: www.mass.gov/regulatory-review.

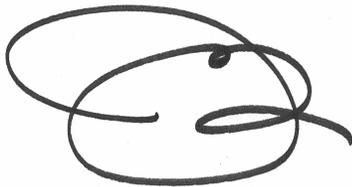
MA Endangered Species Act (MESA)

If the proposed project is located within Priority Habitat and is not exempt from review (see 321 CMR 10.14), then project plans, a fee, and other required materials must be submitted to the Division to determine whether a Take under the MA Endangered Species Act would occur (321 CMR 10.18). Please note that all proposed and anticipated development must be disclosed, as MESA does not allow project segmentation (321 CMR 10.16). Please visit our website for filing instructions: www.mass.gov/regulatory-review.

We recommend that state-listed species habitat concerns be addressed during the project design phase prior to submission of a formal MESA filing, as avoidance and minimization of impacts to state-listed species and their habitats is likely to expedite regulatory review. Please visit our website for more information on how to request a pre-filing consultation with the Division: www.mass.gov/how-to/request-a-pre-filing-consultation

This evaluation is based on the most recent information available in the NHESP database, which is constantly being expanded and updated through ongoing research and inventory. If the purpose of your inquiry is to generate a species list to fulfill the federal Endangered Species Act (16 U.S.C. 1531 et seq.) information requirements for a permit, proposal, or authorization of any kind from a federal agency, we recommend that you use the NOAA Fisheries Greater Atlantic Region ESA Section 7 Mapper (<https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=1bc332edc5204e03b250ac11f9914a27>) and the U.S. Fish and Wildlife Service's Information for Planning and Conservation website (<https://ecos.fws.gov/ipac>). If you have any questions regarding this letter please contact Emily Holt, Endangered Species Review Assistant, at Emily.Holt@mass.gov.

Sincerely,



Jesse Leddick
Assistant Director

Attachment J

Post Dredge Backfill Rate Analysis

SUBJECT

Post Dredge Backfill Rate Analysis Summary

DATE

January 8, 2026

The numerical models developed for Nantucket Harbor and Madaket Harbor in the first phase of the Nantucket Harbors Sediment Transport Study and Dredge Plan Project are used to analyze the sediment backfill rate after dredging to support design and permitting associated with proposed improvement dredging at both Hither Creek and Polpis Harbor.

Numerical Model

The two-dimensional coastal modeling system (CMS) has been adopted in both the previous and current phases of the project. This system accounts for winds, tides, and wave-current interactions. The model is driven by wave conditions from the Nantucket Sound buoy (NDBC#44020), wind data from the Nantucket Island Station (NOAA#8449130), and tidal data from the ADCIRC database. The model integrates offshore bathymetric data from NOAA's "Earth TOPOgraphy" dataset (ETOPO, 2022), nearshore data from NOAA's Digital Coast, 2016 LiDAR data, the 2018 LiDAR survey covering the federal navigation channel, and targeted single beam bathymetric surveys conducted in 2023 for the navigation channels of Polpis and Madaket harbors. Sediment sampling data from the Nantucket Estuary, documented by Lidz (1965) and the latest data from CEC (2023), were incorporated into the model to represent bed composition, which ranges from clay to gravel. Polpis Harbor primarily consists of medium sand (D50 = 0.3mm), while Hither Creek contains predominantly very fine sand (D50 = 0.11mm). Details of model configuration are referred to Nantucket Sediment Transport and Dredge Plan Report (August 20, 2024).

To understand the sediment backfill in Polpis Harbor and Hither Creek following a dredging operation, simulations were conducted with the bed elevation adjusted to reflect the dredged surface (2.15 meters [m] below Mean Sea Level [MSL]). Simulations were performed under both winter and spring weather conditions. In total, four simulations were completed, covering the two proposed dredging areas.

Polpis Harbor

Figure 1 illustrates the bathymetry and the areas where dredging activities are proposed. Within the designated polygons, bed elevations are lowered within the model to the targeted depth (-7.35 feet, NAVD88). Using the revised bed elevation data, the model was run over a three-month period, simulating both spring and winter conditions. The sediment volume backfill rate for each dredged polygon was calculated and compared to the rates estimated under the existing conditions. Table 1 lists the backfill rates (cubic yard per day) for each dredged polygon.

Results of the model demonstrate that the mid-section of the navigation channel experiences significant erosion, while deposition predominantly occurs at both ends of the proposed dredge channel. This is illustrated in **Figure 2**. Although dredging operations help reduce erosion rates, they simultaneously increase deposition rates

compared to conditions without dredging. Between winter and spring, sediment mobility is slightly higher during spring due to the increased cross-bank wind waves.

Figure 1. Proposed Dredge Polygons – Polpis Harbor

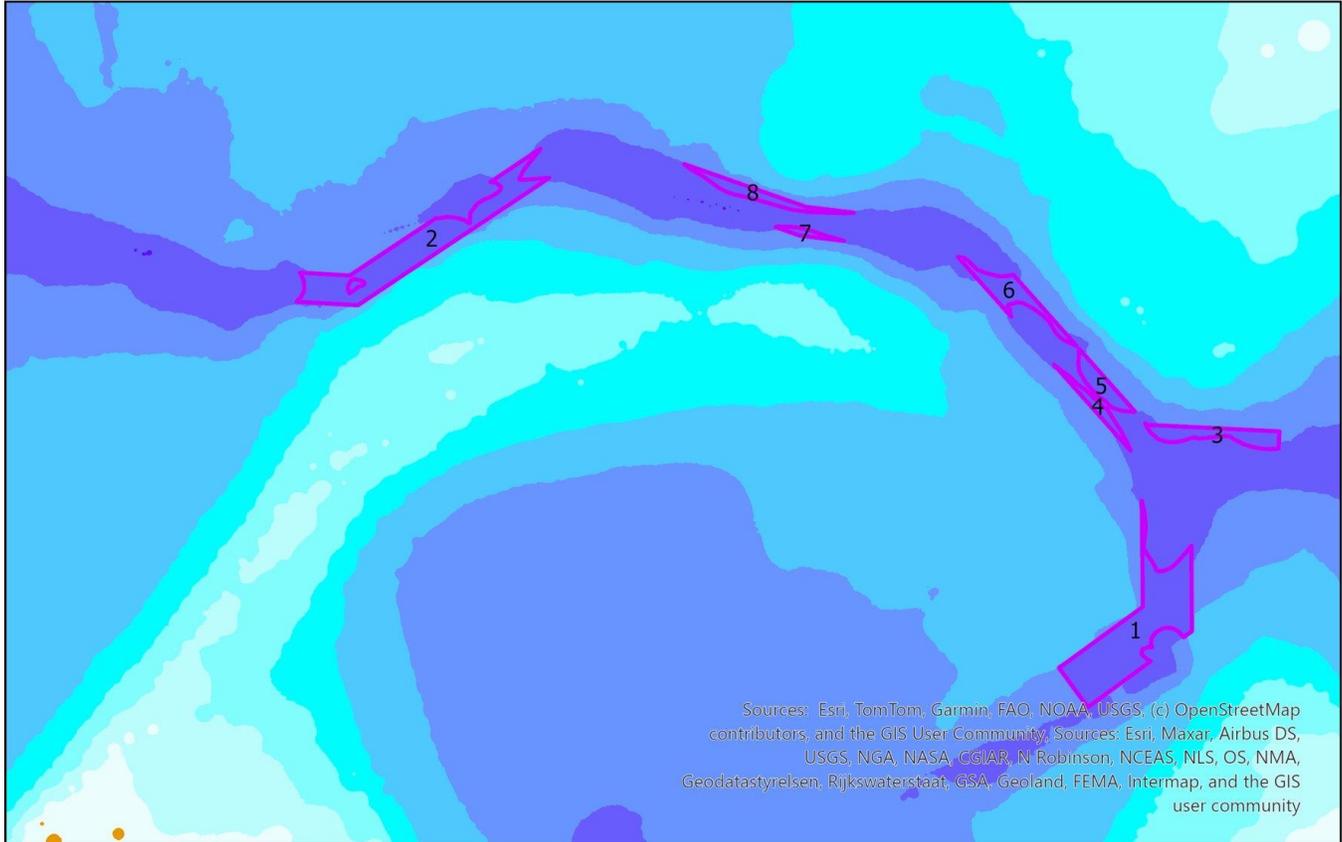
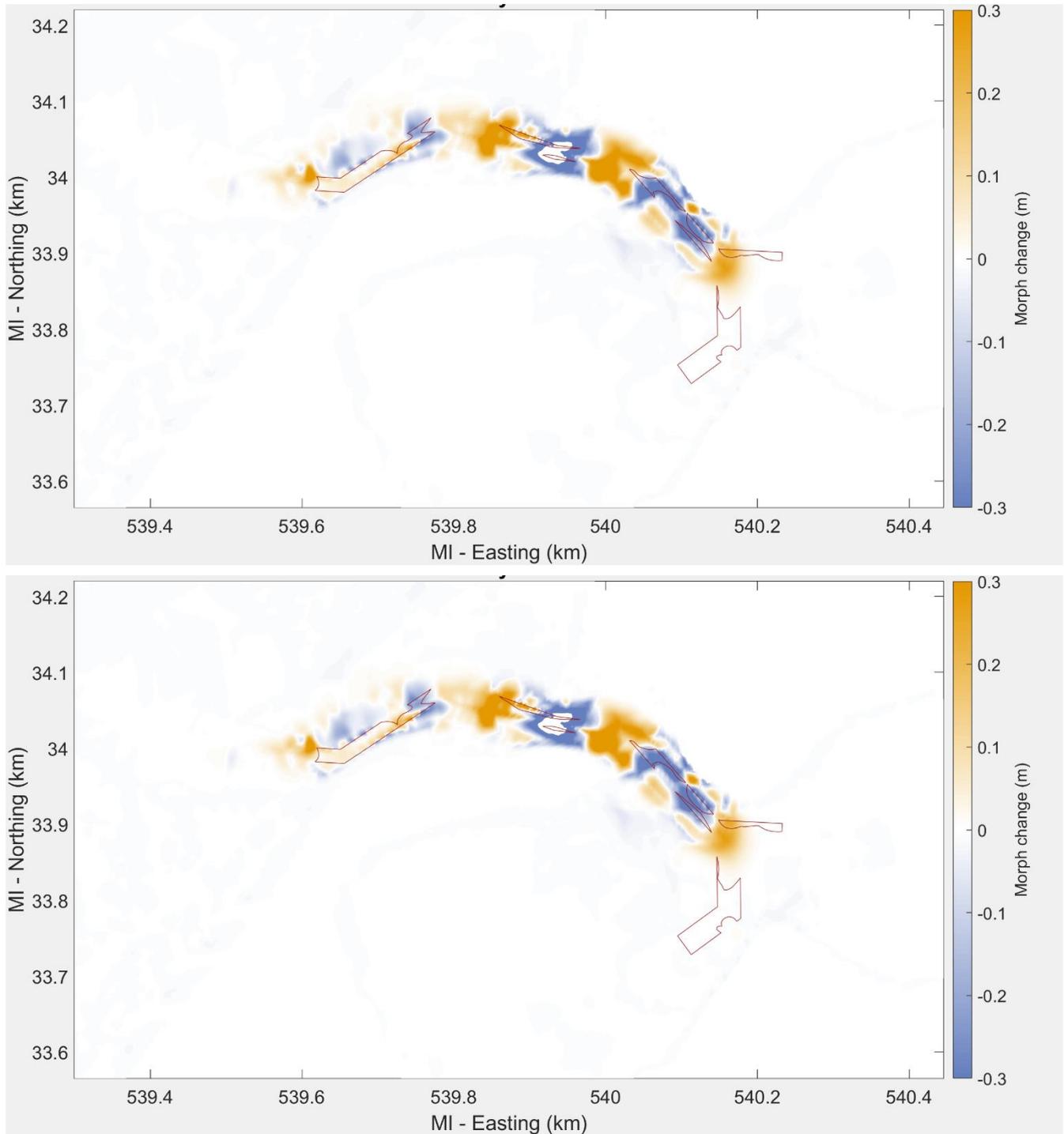


Table 1. Volume Backfill Rates in Polpis Navigation Channel-

Polygon	Backfill Rate in Winter (CY/day)			Backfill Rate in Spring (CY/day)		
	Existing Condition	Post Dredge	Expected Years to Recover	Existing Condition	Post Dredge	Expected Years to Recover
P2	0.3172	1.1	5.3	0.5098	1.6	3.7
P8	-0.7500	-0.2	erosion	-0.7027	0.2	1.7
P7	-1.3187	-1.5	erosion	-1.3577	-1.2	erosion
P6	-2.3538	-2.6	erosion	-2.5066	-1.8	erosion
P5	-1.5109	-1.7	erosion	-1.6068	-1.1	erosion
P4	-0.5864	-0.8	erosion	-0.6263	-0.5	erosion

P3	0.3823	0.8	0.5	0.3988	0.4	0.9
P1	0.0050	0.1	51.7	-0.0195	0.1	103.0

Figure 2. Accumulative Erosion and Deposition after Three Months Following Dredging – Polpis Harbor (top: winter; bottom: spring)



The annual backfill rates are estimated by assuming that the rate for each season is representative of half a year. Table 2 summarizes the estimated annual backfill rates and the expected time required for the dredged volume to be refilled at each dredged polygon.

Table 2. Backfill Annual Rates in Polpis Navigation Channel

Polygon	Existing Condition Annual Backfill Rate (CY/Year)	Proposed Dredged Volume (CY)	Post-dredge Annual Backfill Rate (CY/Year)	Years to Backfill
P2	151.0	2134	490.5	4.4
P8	-265.3	131	2.3	56.2
P7	-488.8	10	-495.5 (erosion)	N/A
P6	-887.6	102	-808.2 (erosion)	N/A
P5	-569.4	98	-528.7 (erosion)	N/A
P4	-221.5	22	-238.8 (erosion)	N/A
P3	142.7	138	219.9	0.6
P1	-2.6	2130	27.7	68.8

Sediment backfilling rates in Polpis Harbor range from 0.1 to 1.6 cubic yards per day (**Table 1**), with the fastest rates near the entrance. Winter and spring show comparable refill rates, although spring experiences a slight increase due to acute cross-bank wind wave patterns, which mobilizes sediment on the bank causing slightly more deposition in the nearby navigation channel section. Erosion and deposition alternate along the channel, with the mid-reach primarily experiencing erosion, which contributes to negative backfill rates. Dredging reduces overall erosion compared to pre-dredge conditions.

The model indicates the need for maintenance dredging (i.e., dredging following initial improvement dredging) within the 10-year timeline within the following polygons: P2 (at the entrance of the inlet) and P3 (at the northern bank of the inner inlet). While deposition is expected at P1 and P8, the conditions are expected to be relatively stable post-dredging and any maintenance dredging to support navigation likely outside of the proposed 10-year permit window. It is also noted that negative backfill rates indicated that subsequent maintenance dredging will not be required at P4 through P7 following proposed improvement dredging.

Hither Creek

Figure 3 illustrates the bathymetry and the areas where dredging activities are proposed within Hither Creek. Within the designated polygons, bed elevations are lowered within the model to the targeted depth (-7.35 feet, NAVD88). Consistent with Polpis Harbor, and using the revised bed elevation data, the model was run over a three-month period, simulating both spring and winter conditions. The sediment volume backfill rate for each dredged polygon was calculated and compared to the rates estimated under the existing conditions. Table 3 lists the backfill rates (cubic yard per day) for each dredged polygon.

Results of the model demonstrate that along the channel, sediment deposition occurs overall during both seasons, regardless of whether dredging operations are conducted. However, the deposition backfill rates are higher under post-dredge conditions and greater during winter than in spring due to intense wind waves. The morphological changes in depth at the end of the simulations are shown in **Figure 4** for both winter and spring.

Figure 3. Proposed Dredge Polygons – Hither Creek.

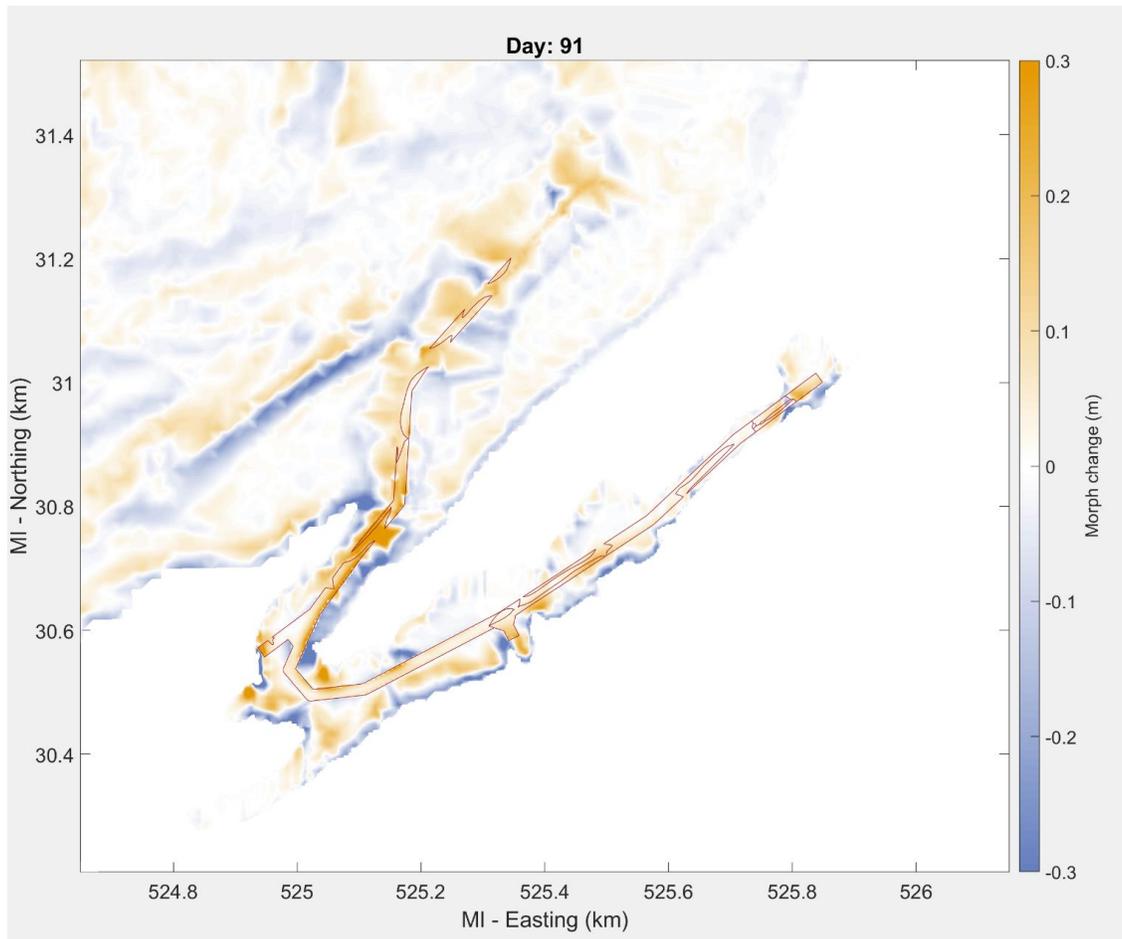


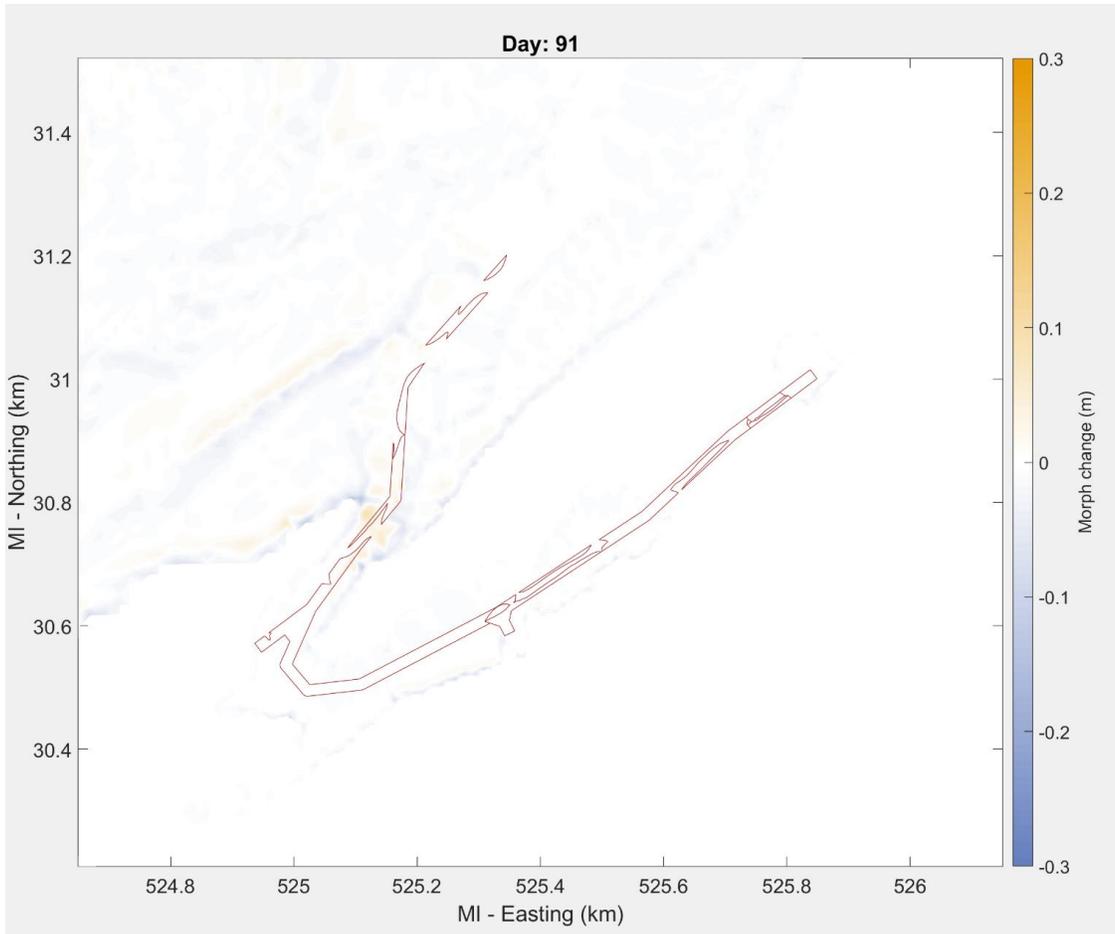
Table 3. Volume Backfill Rates in Hither Navigation Channel

Polygon	Backfill Rate in Winter (CY/day)			Backfill Rate in Spring (CY/day)		
	Existing Condition	Post Dredge	Expected years to recover	Existing Condition	Post Dredge	Expected years to recover
P3	0.266	0.46	0.2	0.017	0.02	4.8
P4	1.162	1.79	0.3	0.106	0.12	4.2
P1	4.266	7.84	0.5	0.374	0.88	4.1
P2	3.848	16.93	1.4	0.385	0.59	41.2

P7	2.237	3.02	0.6	0.055	0.06	29.2
P6	0.334	0.43	0.7	0.003	0.00	74.3
P5	1.411	2.09	2.5	0.030	0.04	146.8
P10	0.114	0.32	1.1	0.008	0.01	42.1
P8	0.170	0.43	3.7	0.004	0.00	349.6
P9	1.286	1.81	0.9	0.030	0.04	42.2

Figure 4. Accumulative Erosion and Deposition after Three Months Following Dredging – Hither Creek (top: winter; bottom: spring)





The annual backfill rates are estimated by assuming that the rate for each season is representative of half a year. Table 4 summarizes the estimated annual backfill rates and the expected time required for the dredged volume to be refilled at each dredged polygon. The dredged areas in polygons P3, P4, and P1 near the entrance of Hither Creek are refilled within half a year to three-quarters of a year due to the minor dredging required to achieve the target depth. However, the backfill rates are slower compared to those in the middle section of the navigation channel, e.g. Polygons P2, P7, P6 and P5, where re-dredging is expected within three years. From the middle section to the interior sections of the channel, the time expected before re-dredging varies from one to seven years.

Table 4. Backfill Annual Rates in Hither Navigation Channel

Polygon	Existing Condition Annual Backfill Rate (CY/year)	Dredged Volume (CY)	Post-dredge Annual Backfill Rate (CY/Year)	Years to Backfill
P3	51.5	37	87.7	0.4
P4	231.5	190	349.6	0.5
P1	847.4	1321	1591.9	0.8

P2	773.1	8845	3198.3	2.8
P7	418.5	625	561.5	1.1
P6	61.7	109	79.3	1.4
P5	263.2	1903	389.0	4.9
P10	22.3	126	59.6	2.1
P8	31.7	579	79.8	7.3
P9	240.3	594	337.8	1.8

Hither Creek shows variable sediment backfill rates along its navigation channel, with rates ranging from 0.3 to 16.9 cubic yards per day (CY/day) during winter and between 0.0 and 0.9 CY/day in spring (Table 3). The highest backfill rates occur from the entrance to the mid-reach of the channel, while interior sections experience lower rates. Notably, sedimentation increases significantly after dredging, as demonstrated by a rise from 3.8 CY/day to 16.9 CY/day in a middle section of the channel. The first three dredging areas (P3, P4, and P1) are particularly important, as they may refill within one winter or take up to five years, necessitating frequent monitoring and potential maintenance dredging.

The model indicates a need for maintenance dredging within a 10-year timeline for all polygons. On average, annual maintenance dredging is likely required for three polygons near the entrance (**P3, P4, and P1**). For the remaining polygons, dredging is expected every one to seven years, with an average recommendation of dredging every three years.

Findings and recommendations

Both Polpis Harbor and Hither Creek experience variable sediment backfill rates that change with the seasons and across different sections of their channels. Both areas see a significant increase in sedimentation rates after dredging activities (or decrease in erosion rate in some sections of Polpis harbor), suggesting that dredging impacts the sediment dynamics of the channels. Specific sections of the channels, identified as critical (P2 in Polpis Harbor and P3, P4, and P1 in Hither Creek), have been highlighted for their importance in maintaining navigability and requiring frequent monitoring and maintenance dredging due to their faster refill rates.

By estimating annual backfill rates, with each season representing half a year, the interval before re-dredging is projected to range from one to seven years, with the frequency of dredging largely influenced by these critical areas as noted in this memo.

Attachment K

Preliminary Project Drawings

TOWN OF NANTUCKET
PROPOSED DREDGING AT POLPIS HARBOR

INDEX TO DRAWINGS:

1. POLPIS HARBOR PROJECT NOTES
2. POLPIS HARBOR PROPOSED PLAN
3. POLPIS HARBOR PROPOSED PARTIAL PLAN
4. POLPIS HARBOR PROPOSED PARTIAL PLAN
5. POLPIS HARBOR PROPOSED PARTIAL PLAN
6. POLPIS HARBOR PROPOSED PARTIAL PLAN
7. POLPIS HARBOR ELEVATION
8. POLPIS HARBOR CROSS SECTION
9. POLPIS HARBOR CROSS SECTION
10. POLPIS HARBOR CROSS SECTION

GENERAL NOTES:

1. THE PURPOSE OF THESE DRAWINGS ARE FOR REGULATORY REVIEW ONLY.
2. ELEVATIONS REFERENCE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), UNLESS NOTED OTHERWISE.
3. TIDAL ELEVATION DATA HAS BEEN TAKEN FROM NANTUCKET ISLAND DATUM (NO. 8449130) FROM THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) WEBSITE.
4. RESULTS OF BATHYMETRY SURVEY FROM COASTAL ENGINEERING CO. DATED 5/19/2023.
5. TOPOGRAPHIC CONTOURS DERIVED FROM 2018 TOWN OF NANTUCKET LIDAR: NANTUCKET ISLAND, MA DATASET.
6. LIMITS OF FRESH WATER WETLANDS, AS SHOWN, HAVE NOT BEEN DELINEATED. LIMITS ARE APPROXIMATE, AND BASED UPON AVAILABLE MAGIS INFORMATION.
7. LIMITS OF EELGRASS BASED UPON TRANSECT LINES SURVEYED BY CR ENVIRONMENTAL, INC. ON SEPTEMBER 2 - 6, 2025.
8. ALL AREAS BETWEEN MEAN LOW WATER AND MEAN HIGH WATER ASSUMED TO REPRESENT COASTAL BEACH HABITAT.
9. PARCEL INFORMATION ACQUIRED FROM MAGIS DATABASE.
10. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES SHOWN, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THAT TIME.
11. ALL PROPOSED DREDGING IS LOCATED WITHIN THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) 100 YEAR FLOODPLAIN (ZONE VE, FLOOD INSURANCE RATE MAP [FIRM] PANEL 25019C0092G, EFFECTIVE 6/9/2014).

DREDGE NOTES:

1. ALL PROPOSED DREDGING SHALL BE TO A DEPTH OF -7.35' WITH A 2-FT ALLOWABLE OVERDREDGE TO A DEPTH OF -9.35'.
2. TOTAL ESTIMATED DREDGE VOLUME EQUALS 15,747 CUBIC YARDS. TOTAL ESTIMATED DREDGE AREA EQUALS 1.71 ACRES.

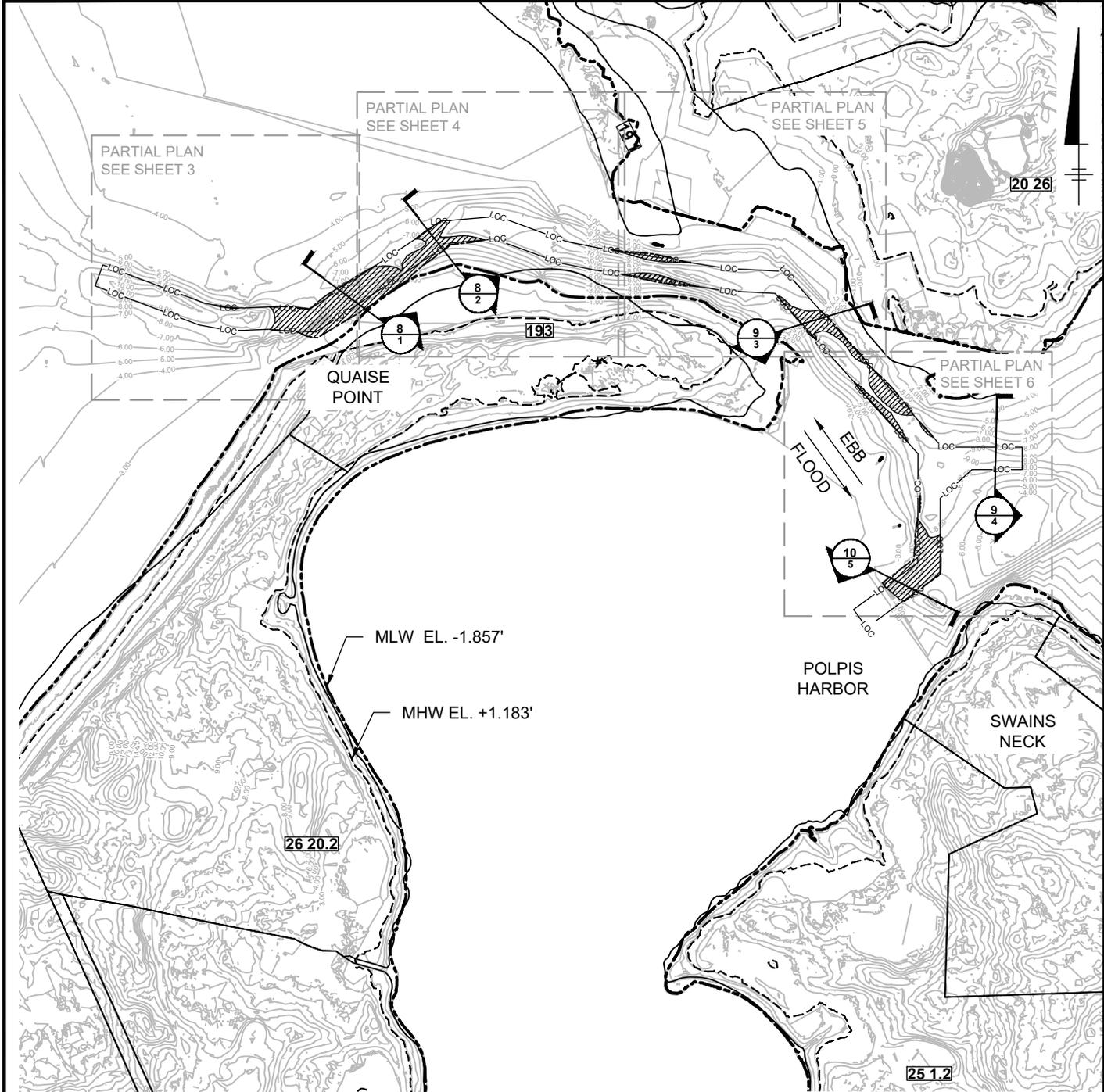
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MEAN HIGH WATER (MHW)	+1.183
NAVD88	0
MEAN SEA LEVEL (MSL)	-0.287
MEAN LOW WATER (MLW)	-1.857
MEAN LOWER LOW WATER (MLLW)	-2.057

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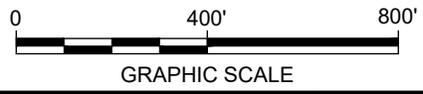
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ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
	
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 - MEAN HIGH WATER (EL. +1.183')
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 - LIMIT OF CHANNEL
 - TOP OF SLOPE
 - PROPOSED DREDGING
 - PARCEL ID

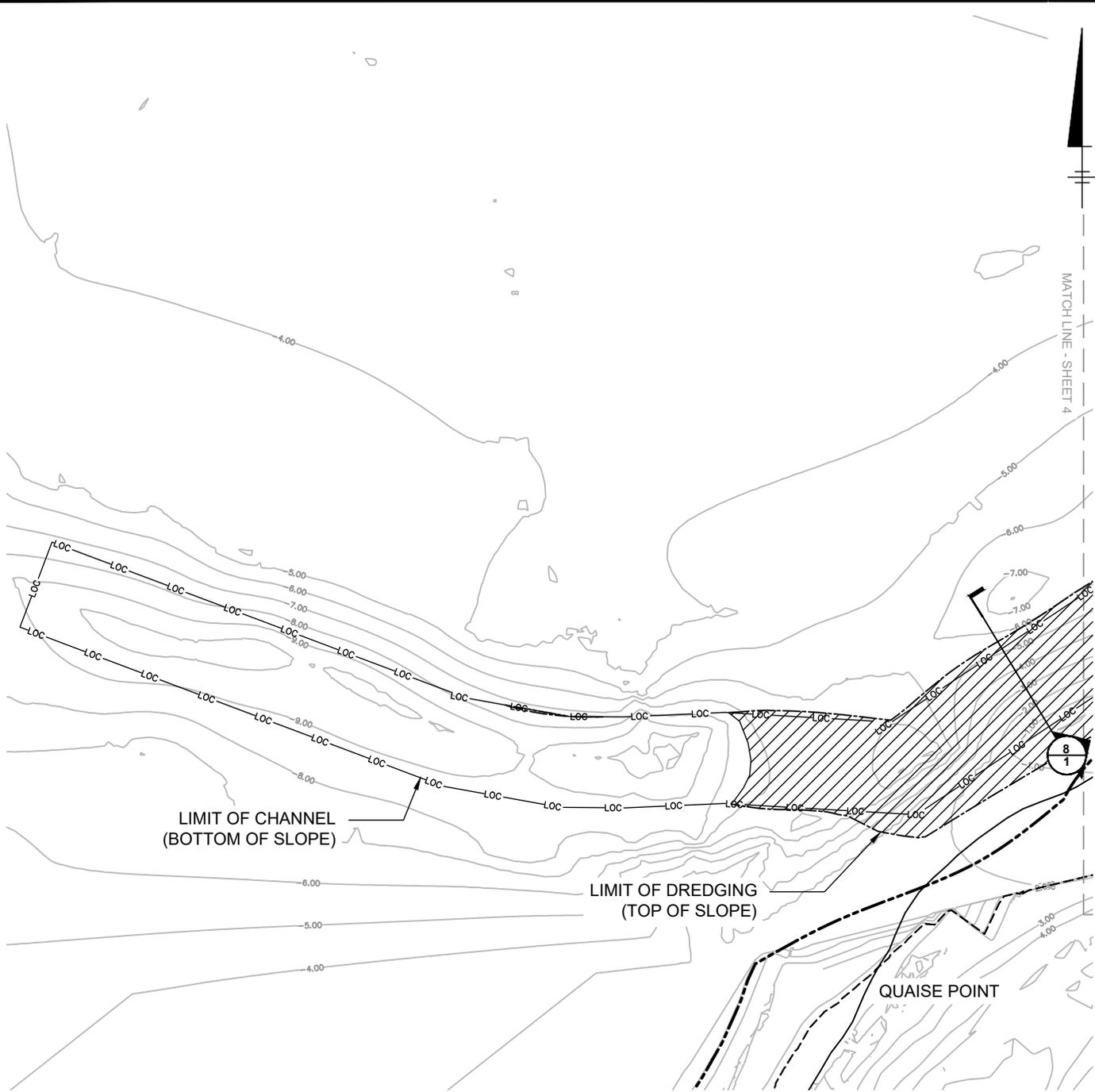


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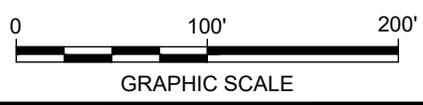


LIMIT OF CHANNEL
(BOTTOM OF SLOPE)

LIMIT OF DREDGING
(TOP OF SLOPE)

QUAISE POINT

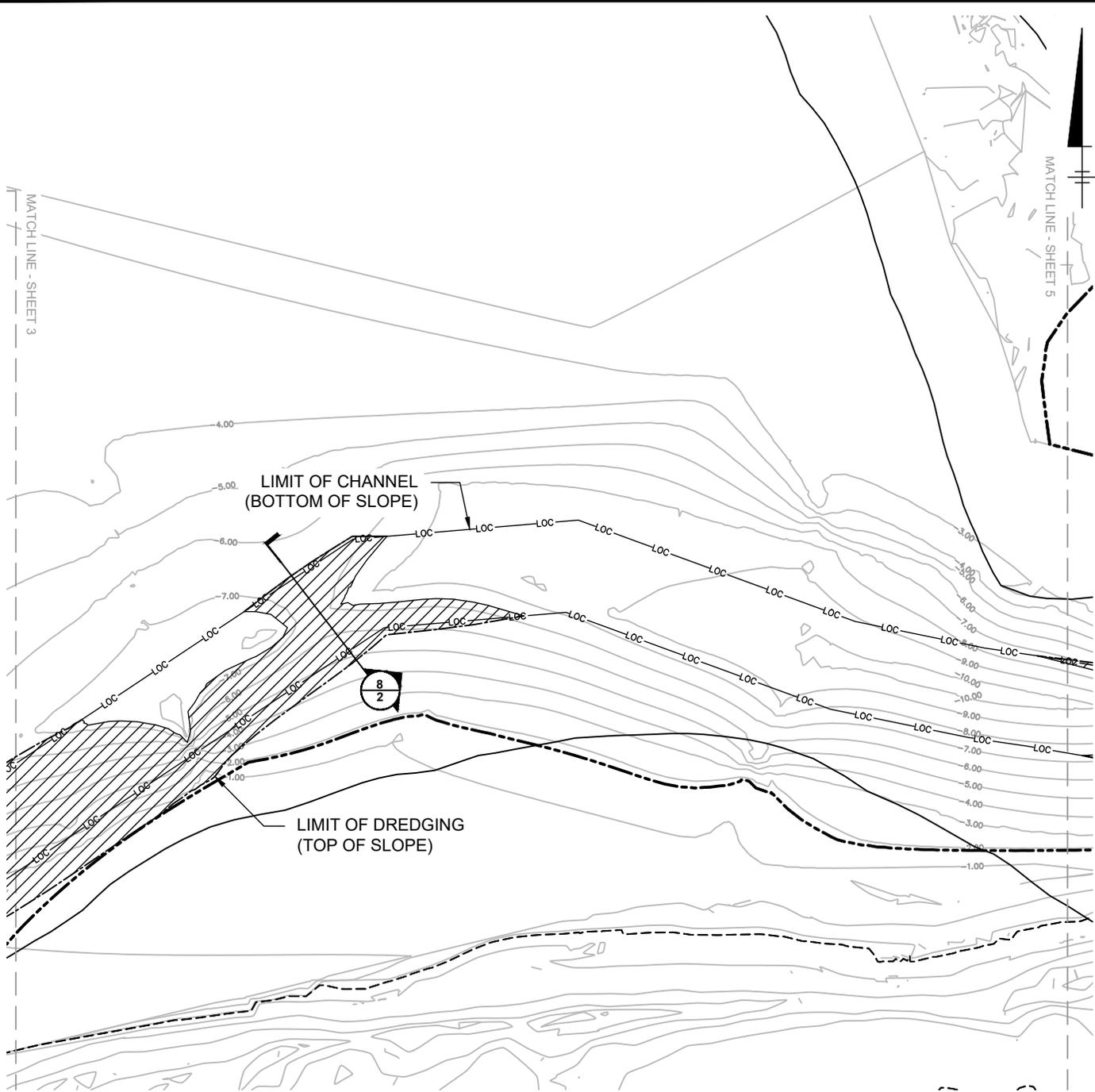
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 - PROPOSED DREDGING



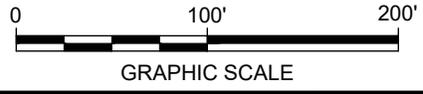
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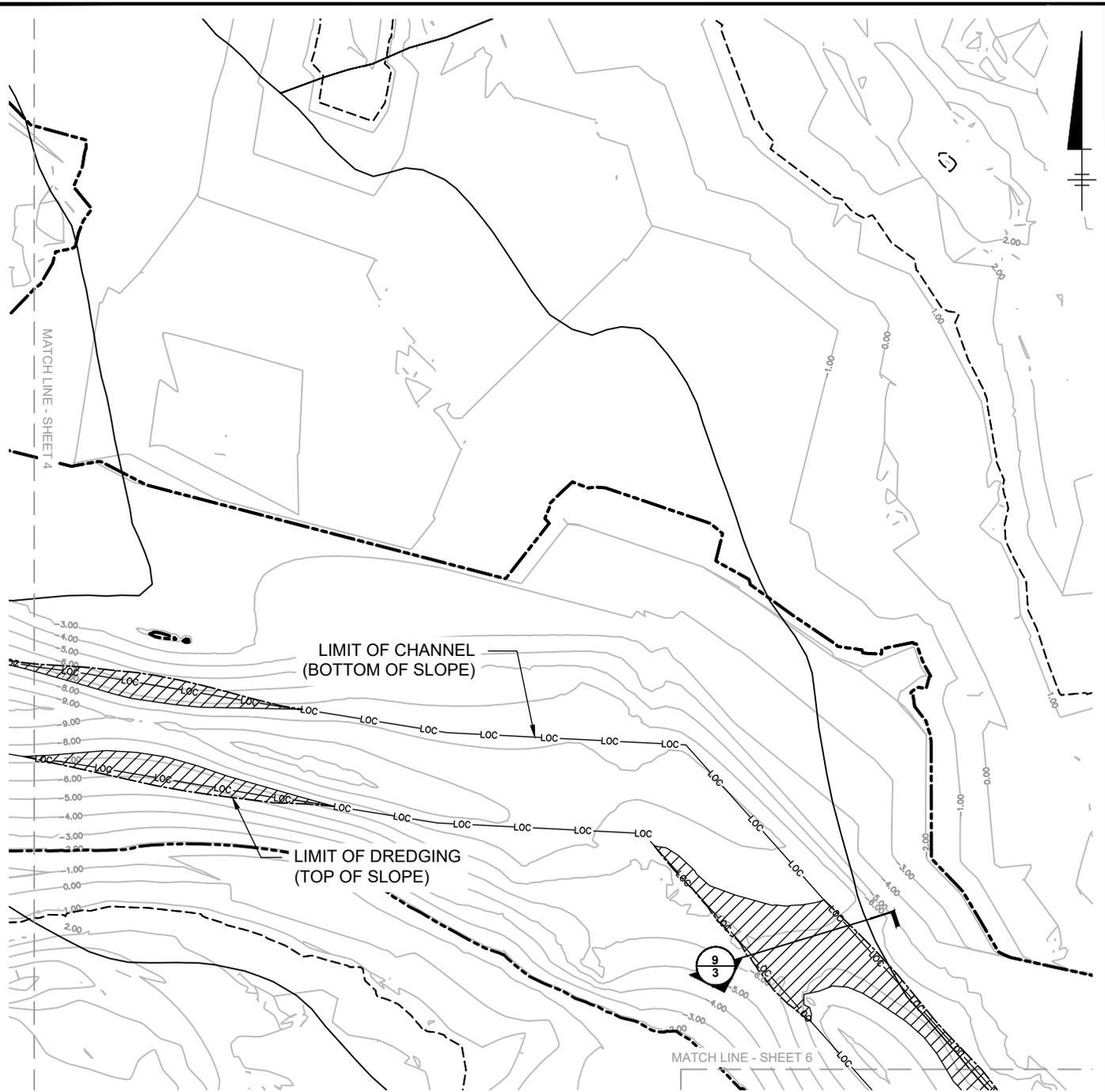
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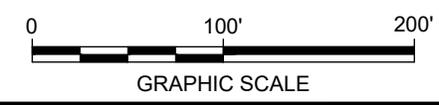
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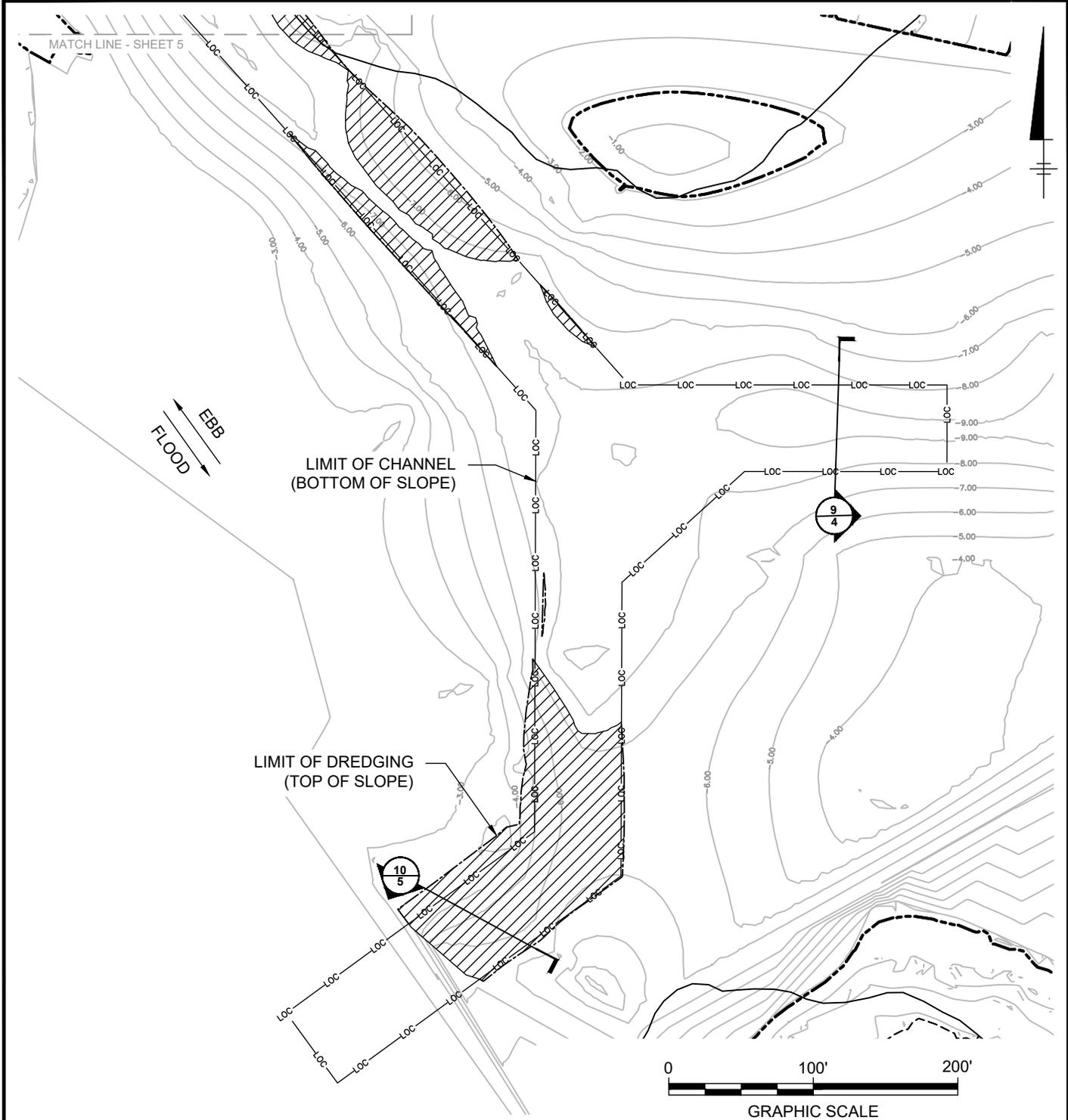
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TOWN OF NANTUCKET NANTUCKET COUNTY, NANTUCKET, MA	
POLPIS HARBOR PROPOSED PARTIAL PLAN	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
PROGRESS PRINT 1-7-2026	SHEET 5



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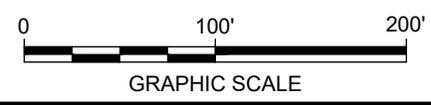


EBB
FLOOD

LIMIT OF CHANNEL
(BOTTOM OF SLOPE)

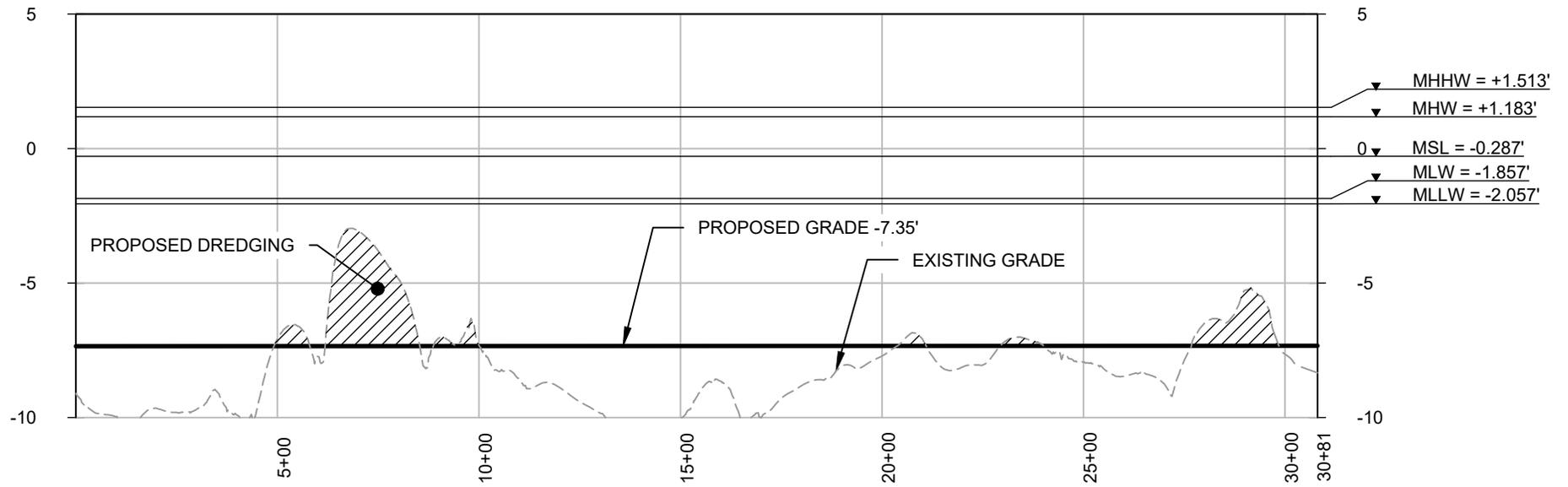
LIMIT OF DREDGING
(TOP OF SLOPE)

- LEGEND:**
- TOPOGRAPHIC AND BATHYMETRIC CONTOURS
 - MEAN LOW WATER (EL. -1.857')
 - MEAN HIGH WATER (EL. +1.183')
 - PARCELS
 - LIMIT OF CHANNEL
 - PROPOSED DREDGING

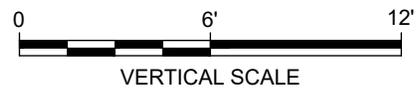
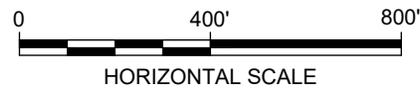


<p>TOWN OF NANTUCKET NANTUCKET COUNTY, NANTUCKET, MA</p>	
<p>POLPIS HARBOR PROPOSED PARTIAL PLAN</p>	
<p>ARCADIS PROJECT NO. 30145716</p>	<p>ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880</p>
<p>DATE : JANUARY 2026</p>	
<p>PROGRESS PRINT 1-7-2026</p>	<p>SHEET 6</p>





PROGRESS PRINT
1-7-2026



TOWN OF NANTUCKET
NANTUCKET COUNTY, NANTUCKET, MA

**POLPIS HARBOR
ELEVATION**

ARCADIS PROJECT NO.
30145716

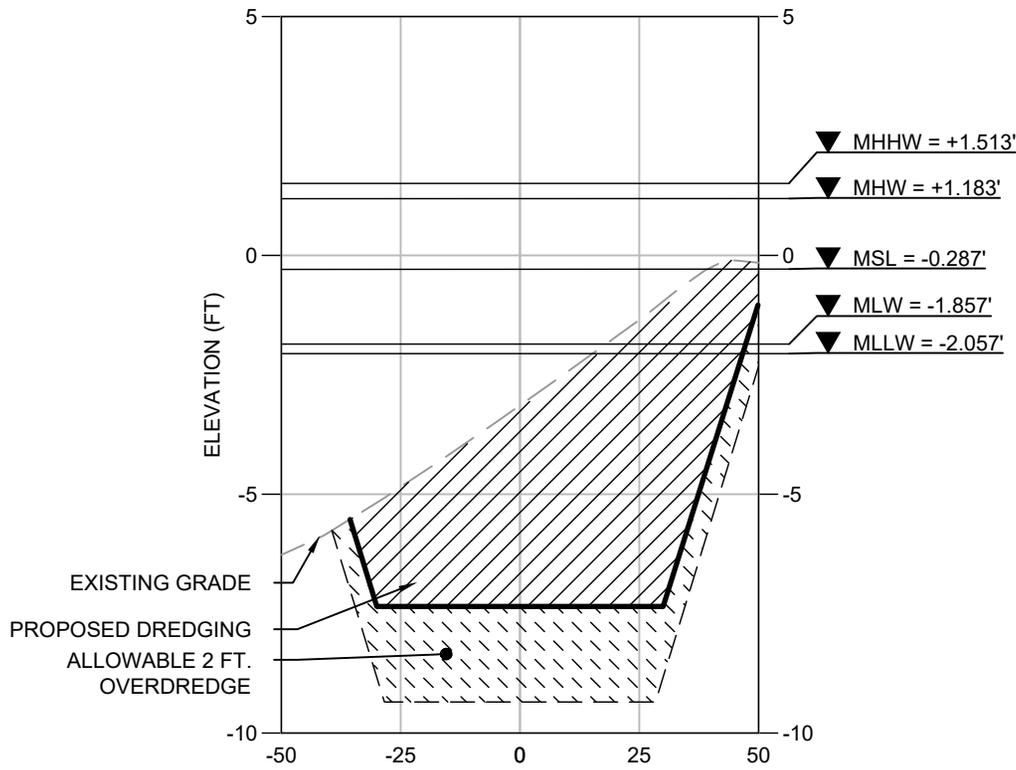
ARCADIS, US, INC.
500 Edgewater Drive
Suite 511, 1880
Wakefield, MA 01880

DATE : JANUARY 2026

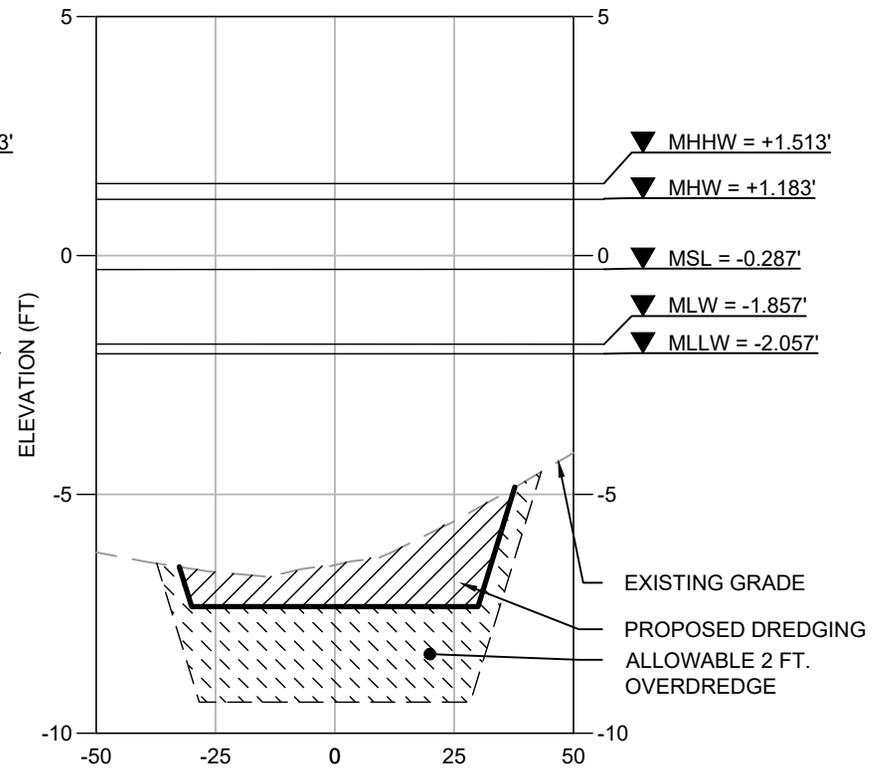


SHEET

7

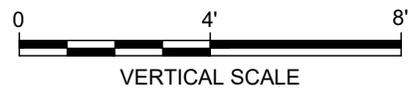
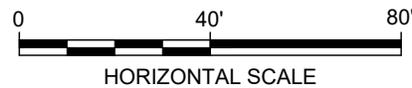


SECTION AT 7+08 **1**



SECTION AT 9+86 **2**

PROGRESS PRINT
1-7-2026



TOWN OF NANTUCKET
NANTUCKET COUNTY, NANTUCKET, MA

**POLPIS HARBOR
CROSS SECTION**

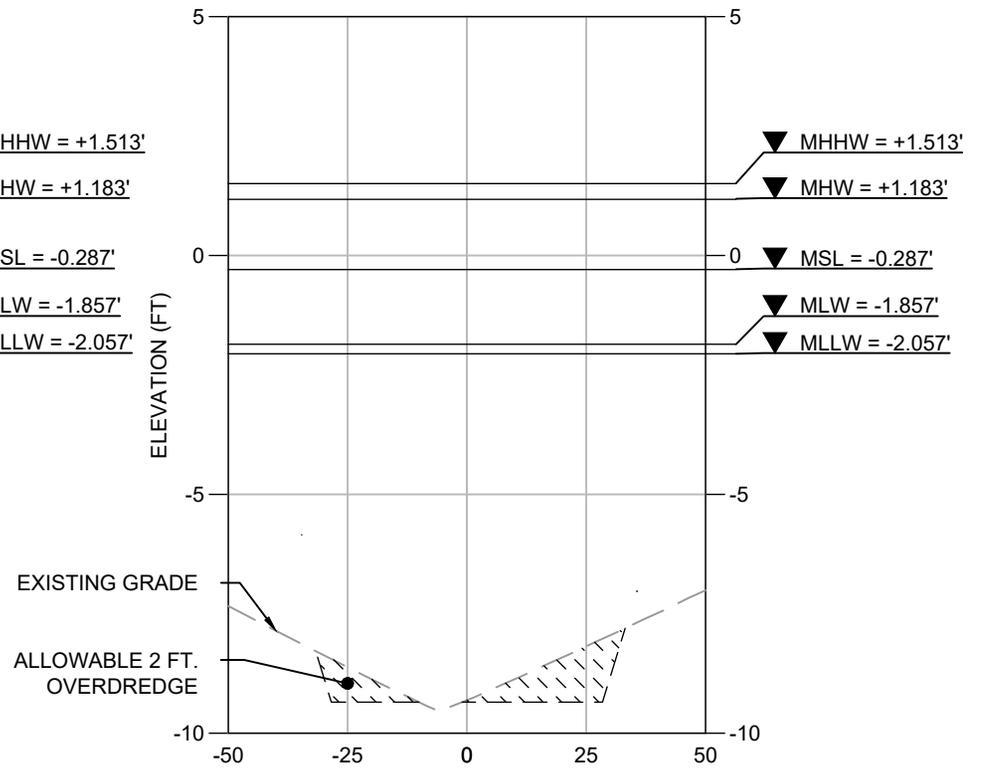
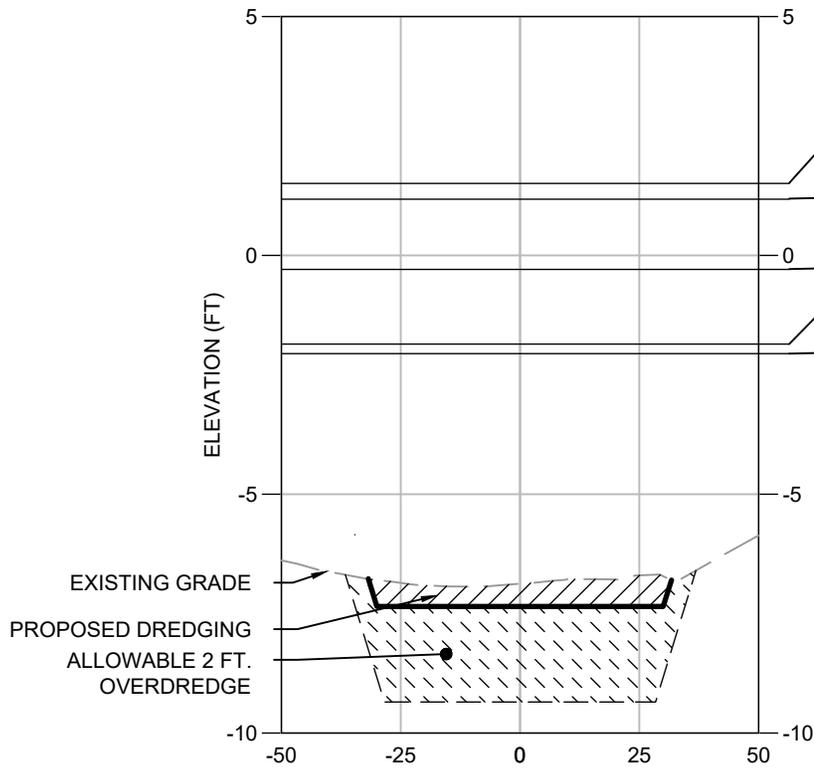
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30145716

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500 Edgewater Drive
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Wakefield, MA 01880

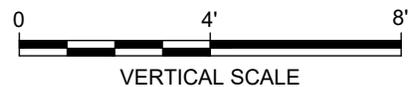
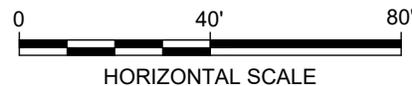
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SHEET
8



PROGRESS PRINT
1-7-2026



TOWN OF NANTUCKET
NANTUCKET COUNTY, NANTUCKET, MA

**POLPIS HARBOR
CROSS SECTION**

ARCADIS PROJECT NO.
30145716

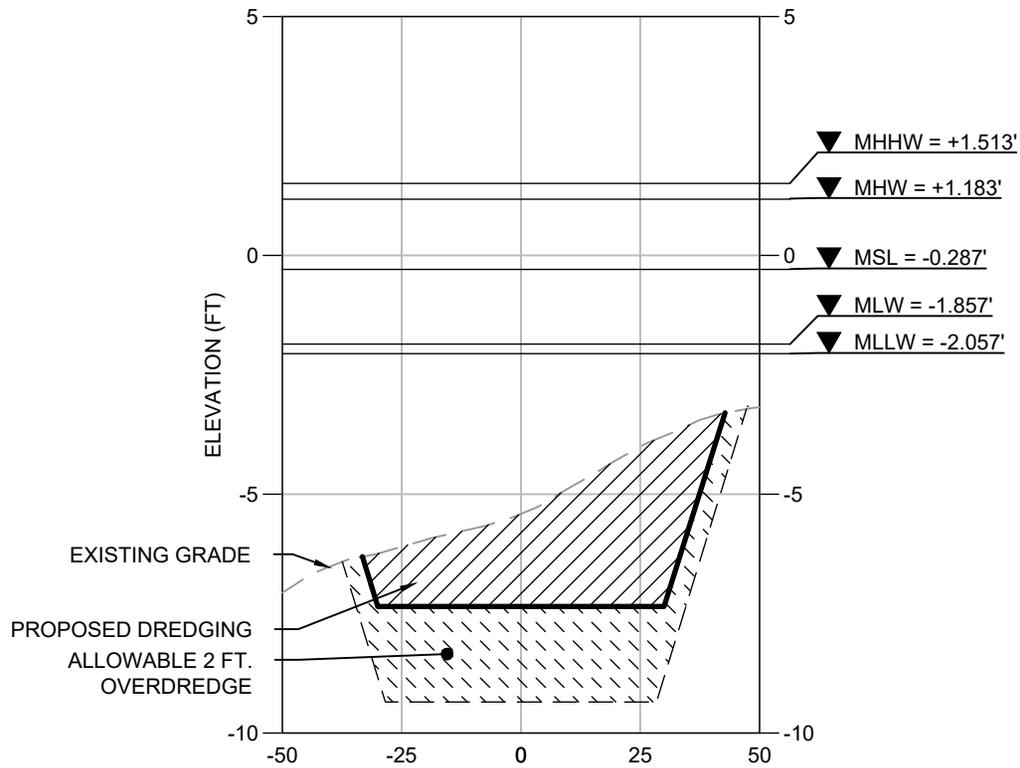
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500 Edgewater Drive
Suite 511, 1880
Wakefield, MA 01880

DATE : JANUARY 2026



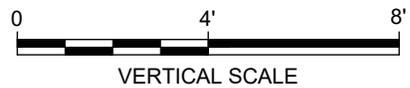
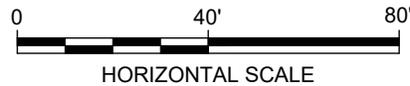
SHEET

9



SECTION AT 31+12 (5)

**PROGRESS PRINT
1-7-2026**



TOWN OF NANTUCKET NANTUCKET COUNTY, NANTUCKET, MA	
POLPIS HARBOR CROSS SECTION	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
	SHEET 10

TOWN OF NANTUCKET
PROPOSED DREDGING AT HITHER CREEK

INDEX TO DRAWINGS:

1. HITHER CREEK PROJECT NOTES
2. HITHER CREEK PROPOSED PLAN
3. HITHER CREEK PROPOSED PARTIAL PLAN
4. HITHER CREEK PROPOSED PARTIAL PLAN
5. HITHER CREEK PROPOSED PARTIAL PLAN
6. HITHER CREEK PROPOSED PARTIAL PLAN
7. HITHER CREEK PROPOSED PARTIAL PLAN
8. HITHER CREEK ELEVATION
9. HITHER CREEK CROSS SECTION
10. HITHER CREEK CROSS SECTION
11. HITHER CREEK CROSS SECTION

GENERAL NOTES:

1. THE PURPOSE OF THESE DRAWINGS ARE FOR REGULATORY REVIEW ONLY.
2. ELEVATIONS REFERENCE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), UNLESS NOTED OTHERWISE.
3. TIDAL ELEVATION DATA HAS BEEN TAKEN FROM NANTUCKET ISLAND DATUM (NO. 8449130) FROM THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) WEBSITE.
4. RESULTS OF BATHYMETRY SURVEY FROM COASTAL ENGINEERING CO. DATED 5/19/2023.
5. TOPOGRAPHIC CONTOURS DERIVED FROM 2018 TOWN OF NANTUCKET LIDAR: NANTUCKET ISLAND, MA DATASET.
6. LIMITS OF FRESH WATER WETLANDS, AS SHOWN, HAVE NOT BEEN DELINEATED. LIMITS ARE APPROXIMATE, AND BASED UPON AVAILABLE MAGIS INFORMATION.
7. LIMITS OF EELGRASS BASED UPON TRANSECT LINES SURVEYED BY CR ENVIRONMENTAL, INC. ON SEPTEMBER 2 - 6, 2025.
8. ALL AREAS BETWEEN MEAN LOW WATER AND MEAN HIGH WATER ASSUMED TO REPRESENT COASTAL BEACH HABITAT.
9. PARCEL INFORMATION ACQUIRED FROM MAGIS DATABASE.
10. THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES SHOWN, AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS AT THAT TIME.
11. ALL PROPOSED DREDGING IS LOCATED WITHIN THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) 100 YEAR FLOODPLAIN (ZONES AE AND VE, FLOOD INSURANCE RATE MAP [FIRM] PANEL 25019C0064G, EFFECTIVE 6/9/2014).

DREDGE NOTES:

1. ALL PROPOSED DREDGING SHALL BE TO A DEPTH OF -7.35' WITH A 2-FT ALLOWABLE OVERDREDGE TO A DEPTH OF -9.35'.
2. TOTAL ESTIMATED DREDGE VOLUME EQUALS 51,089 CUBIC YARDS. TOTAL ESTIMATED DREDGE AREA EQUALS 7.91 ACRES.

PROJECT TIDAL ELEVATIONS (NAVD88)	
DATUM	ELEVATION (FT)
MEAN HIGHER HIGH WATER (MHHW)	+1.513
MEAN HIGH WATER (MHW)	+1.183
NAVD88	0
MEAN SEA LEVEL (MSL)	-0.287
MEAN LOW WATER (MLW)	-1.857
MEAN LOWER LOW WATER (MLLW)	-2.057

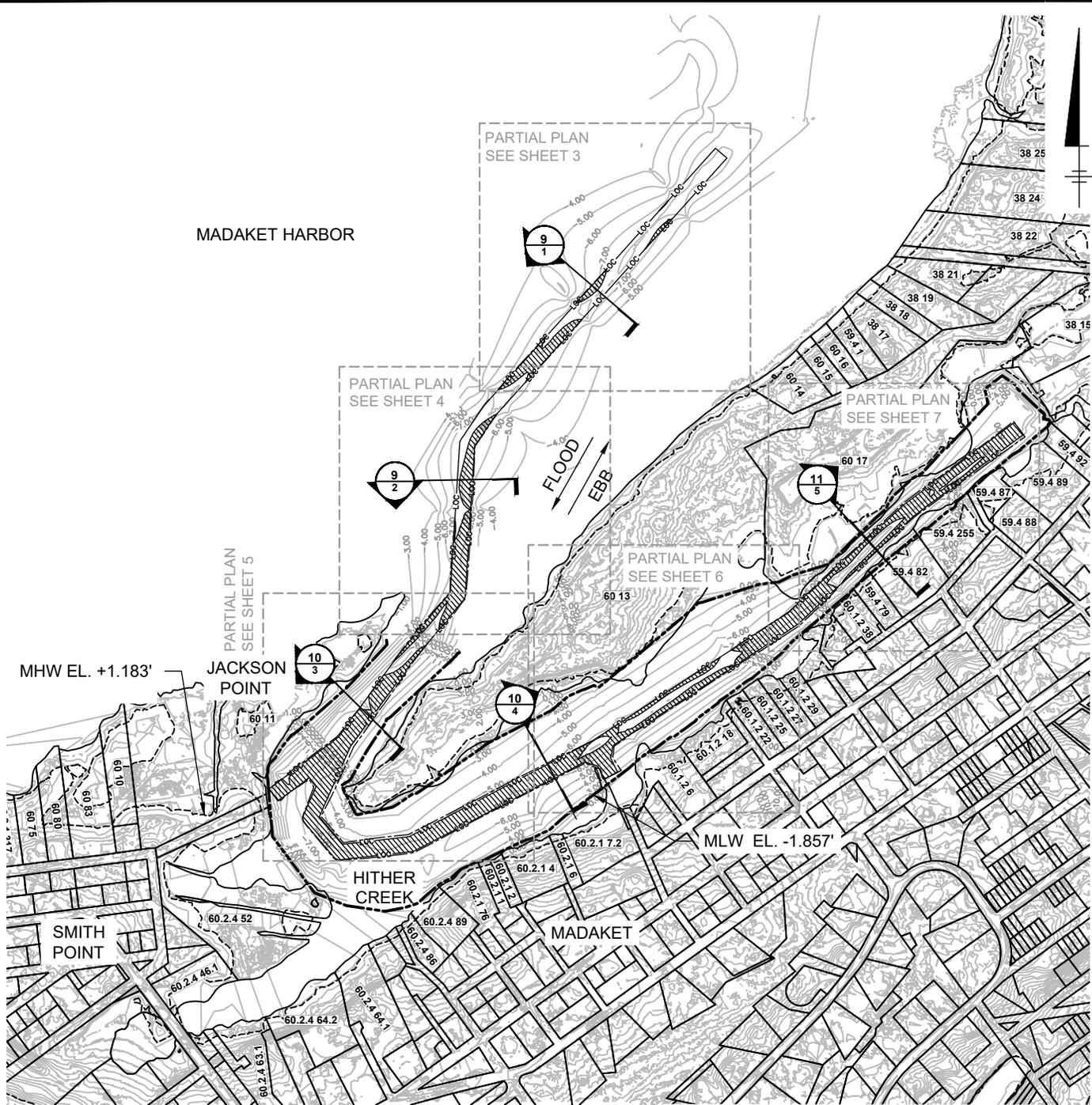
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1-7-2026

TOWN OF NANTUCKET PROPOSED MAINTENANCE DREDGING NANTUCKET COUNTY, NANTUCKET, MA	
HITHER CREEK PROJECT NOTES	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
SHEET	
1	

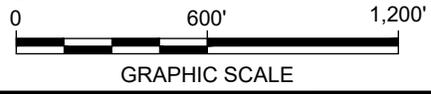


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- LEGEND:**
- TOPOGRAPHIC AND BATHYMETRIC CONTOURS
 - MEAN LOW WATER (EL. -1.857')
 - MEAN HIGH WATER (EL. +1.183')
 - PARCELS
 - LIMIT OF CHANNEL
 - TOP OF SLOPE
 - PROPOSED DREDGING
 - PARCEL ID



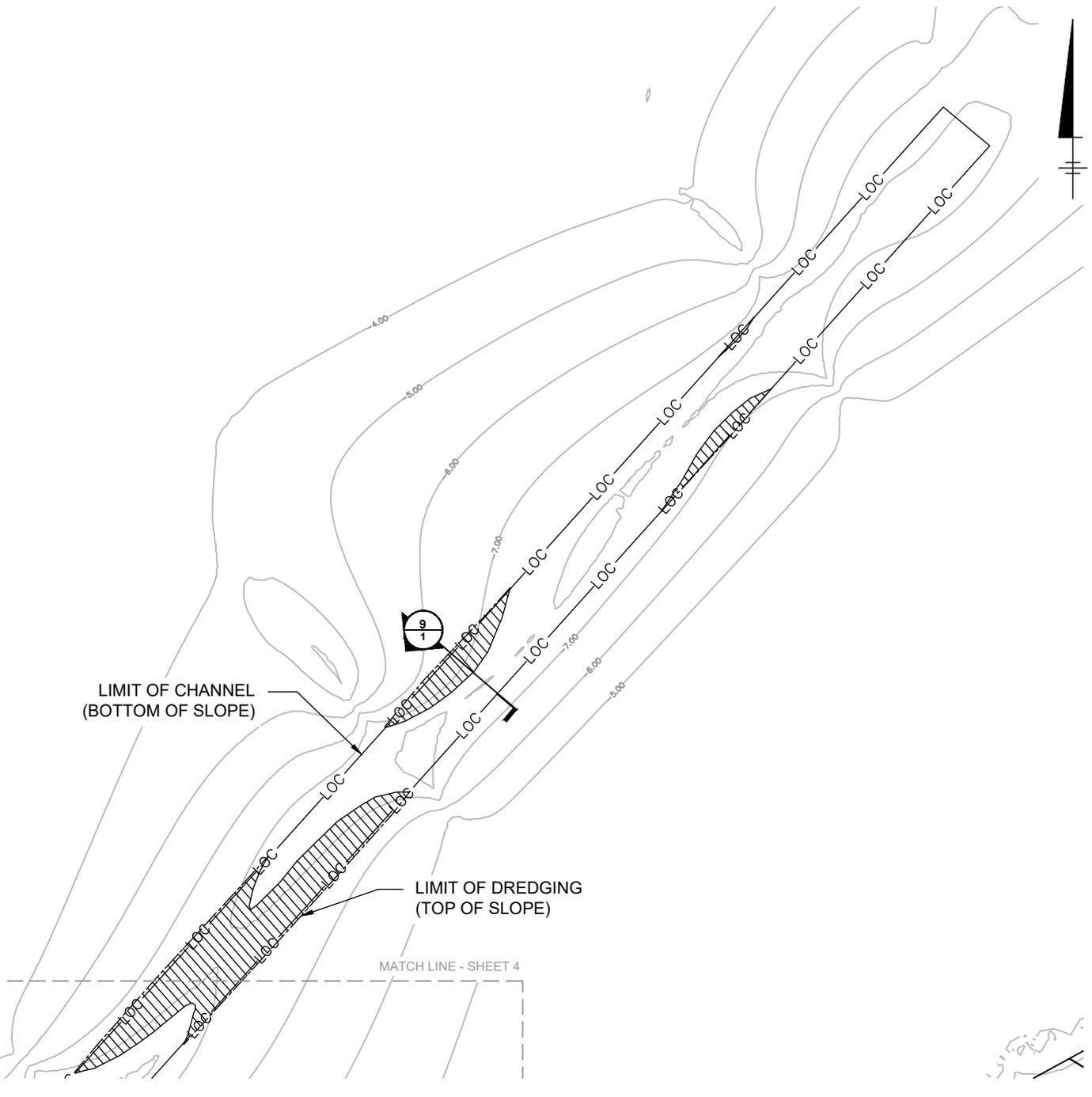
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HITHER CREEK PROPOSED PLAN	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	

PROGRESS PRINT
1-7-2026

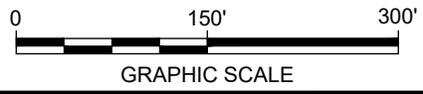


SHEET
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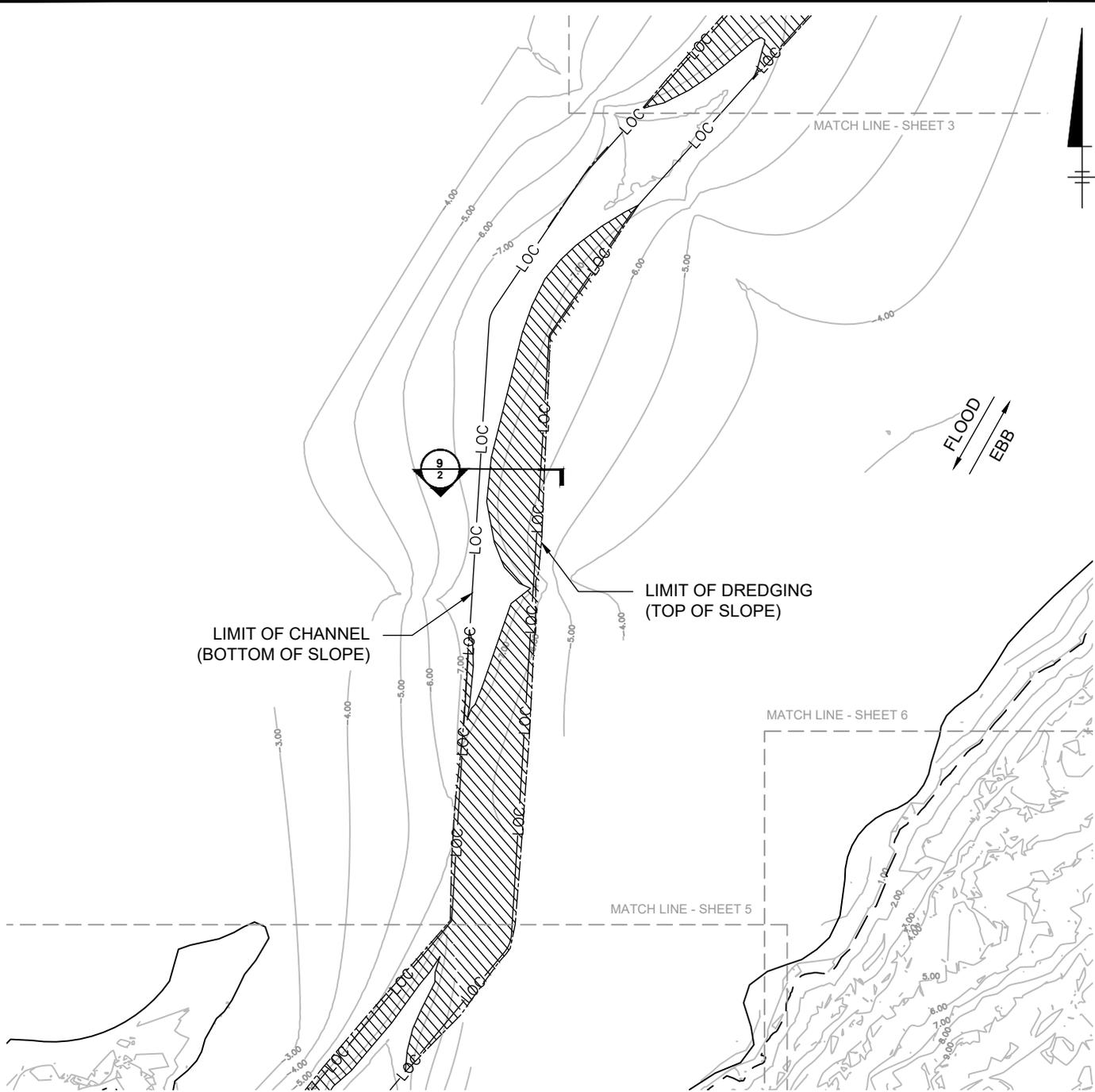
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 - MEAN LOW WATER (EL. -1.857')
 - MEAN HIGH WATER (EL. +1.183')
 - LIMIT OF CHANNEL
 - PROPOSED DREDGING



TOWN OF NANTUCKET NANTUCKET COUNTY, NANTUCKET, MA	
HITHER CREEK PROPOSED PARTIAL PLAN	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
PROGRESS PRINT 1-7-2026	SHEET 3



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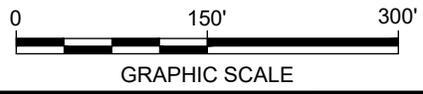


LIMIT OF CHANNEL
(BOTTOM OF SLOPE)

LIMIT OF DREDGING
(TOP OF SLOPE)

FLOOD
EBB

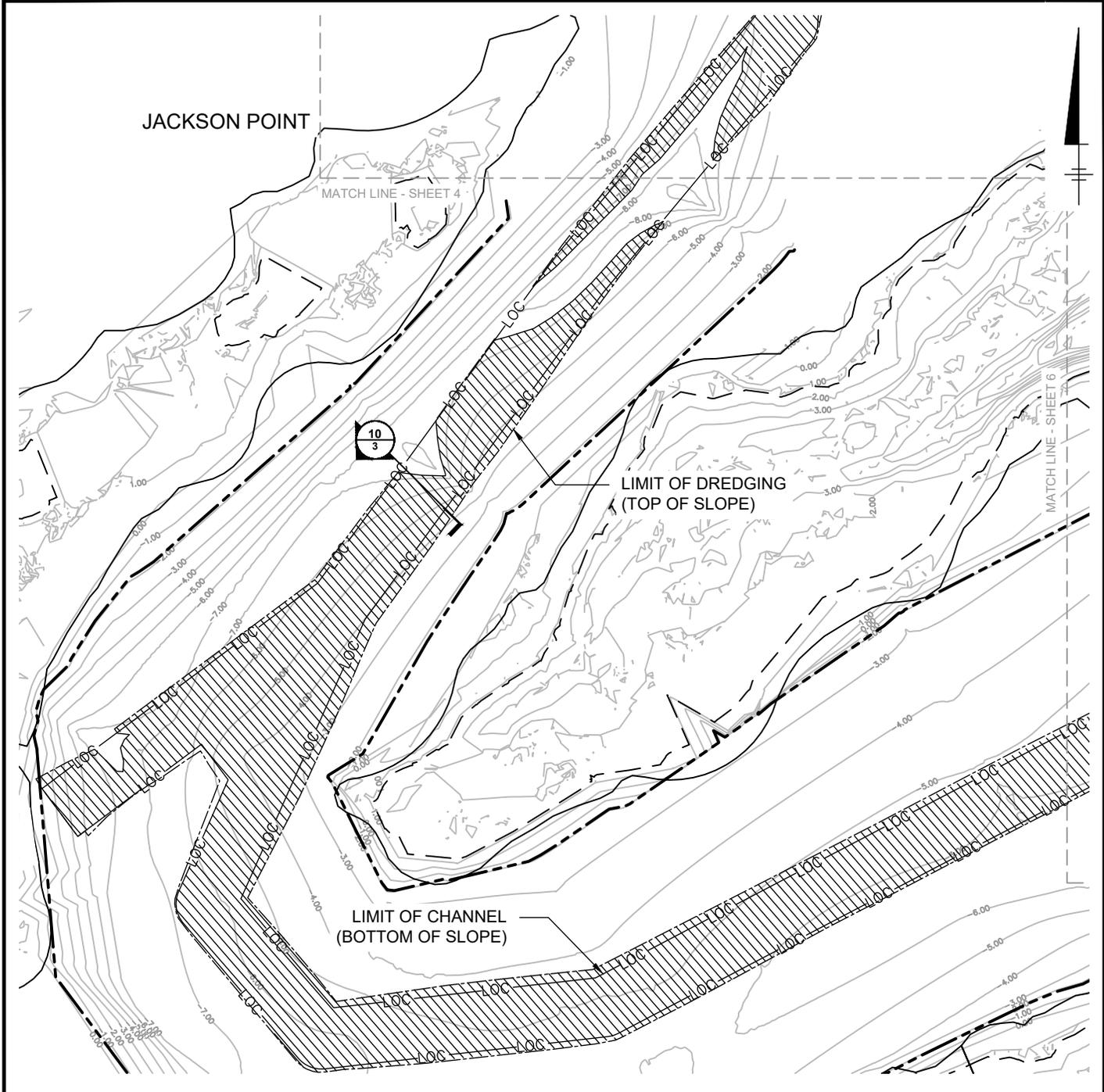
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 - MEAN HIGH WATER (EL. +1.183')
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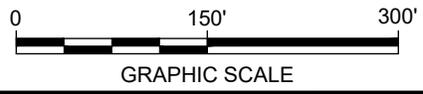
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HITHER CREEK PROPOSED PARTIAL PLAN	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
PROGRESS PRINT 1-7-2026	SHEET 4



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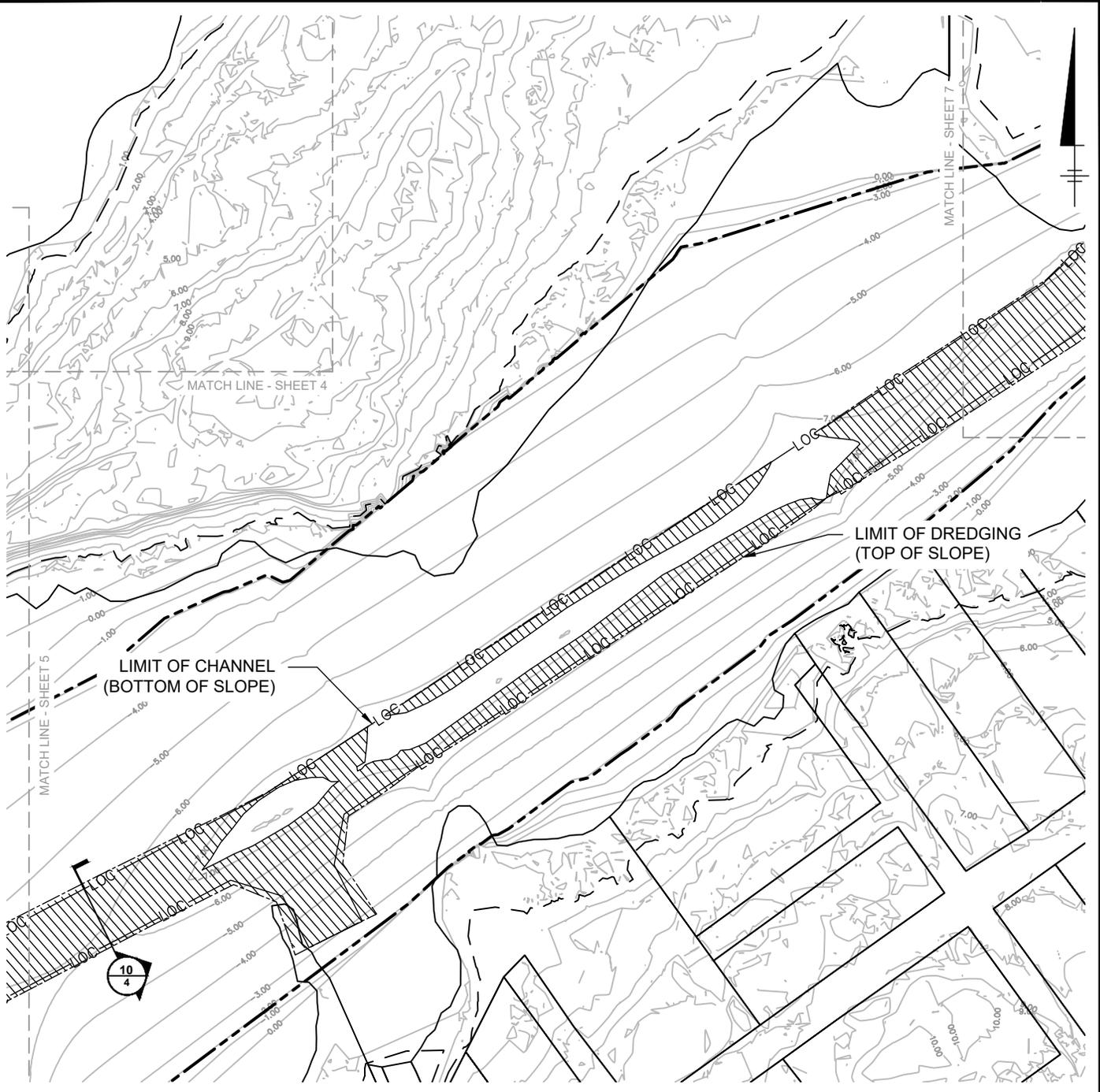
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 - LIMIT OF CHANNEL
 - PROPOSED DREDGING



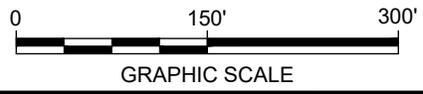
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HITHER CREEK PROPOSED PARTIAL PLAN	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
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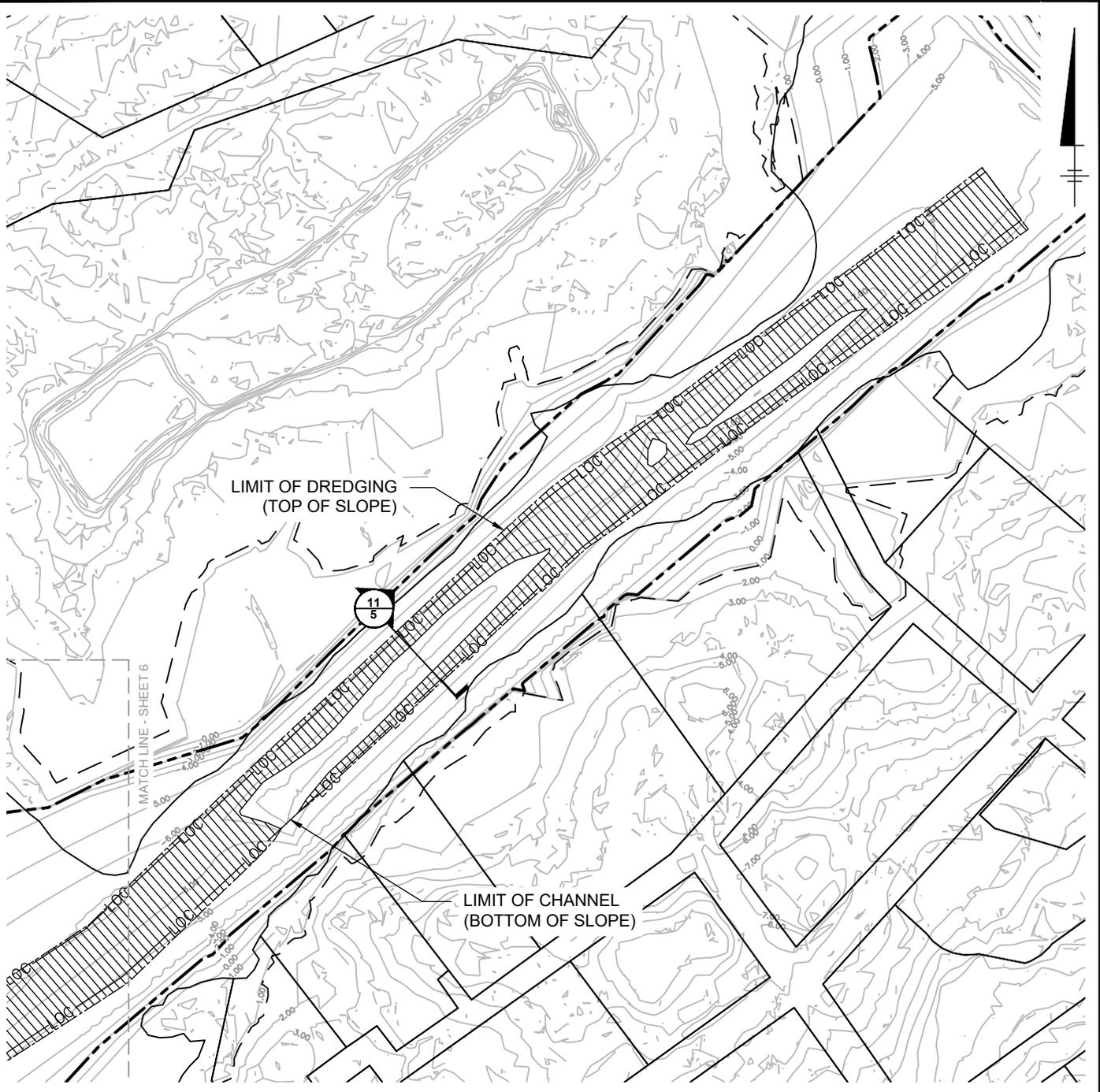
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 - PARCELS
 - LIMIT OF CHANNEL
 - PROPOSED DREDGING



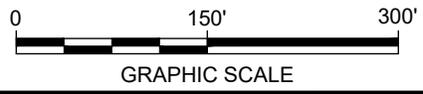
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ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
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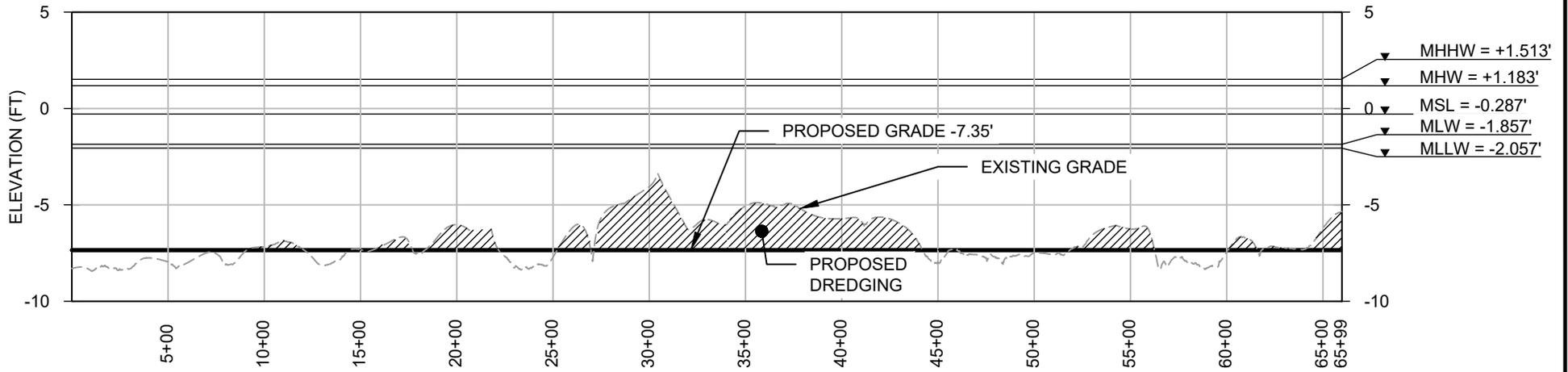
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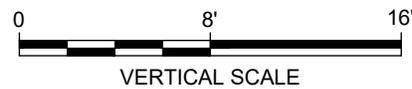
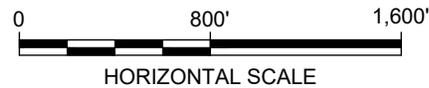
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 - MEAN HIGH WATER (EL. +1.183')
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 - LIMIT OF CHANNEL
 - PROPOSED DREDGING



TOWN OF NANTUCKET PROPOSED MAINTENANCE DREDGING NANTUCKET COUNTY, NANTUCKET, MA	
HITHER CREEK PROPOSED PARTIAL PLAN	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
PROGRESS PRINT 1-7-2026	
SHEET 7	



PROGRESS PRINT
 1-7-2026



TOWN OF NANTUCKET
 NANTUCKET COUNTY, NANTUCKET, MA

**HITHER CREEK
 ELEVATION**

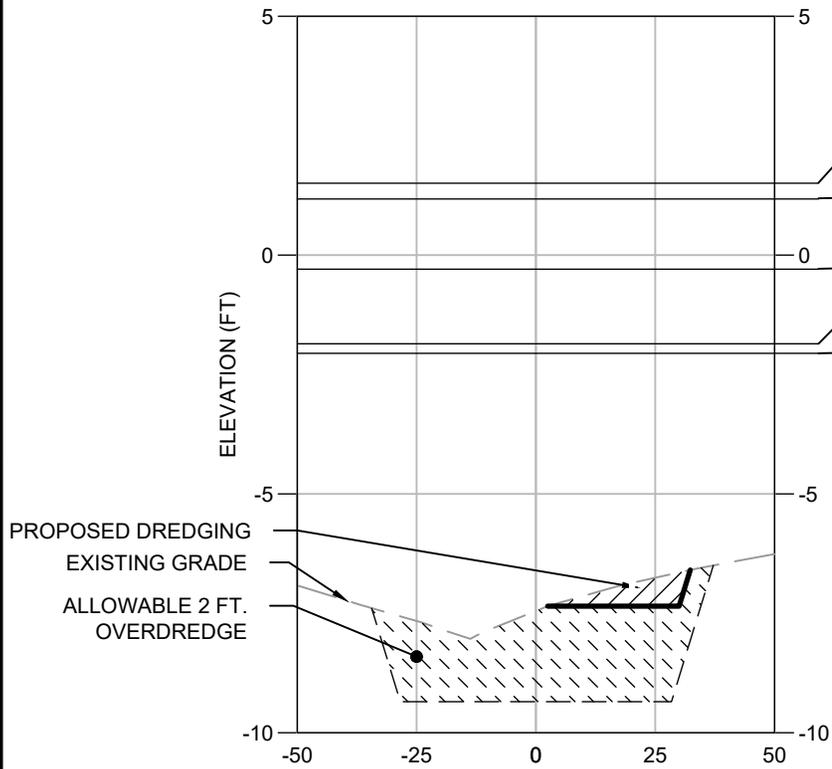
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 30145716

ARCADIS, US, INC.
 500 Edgewater Drive
 Suite 511, 1880
 Wakefield, MA 01880

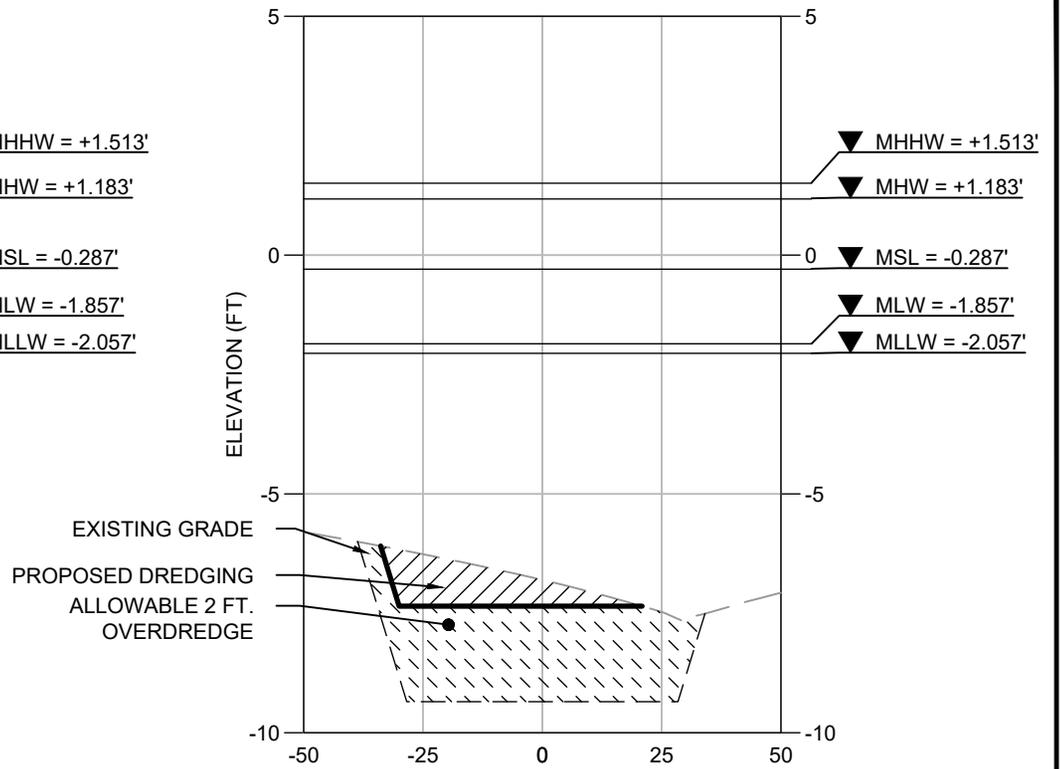
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SHEET
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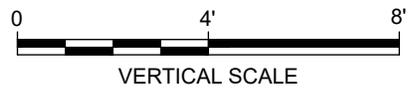
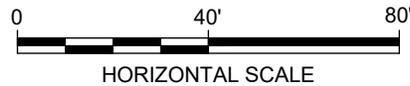


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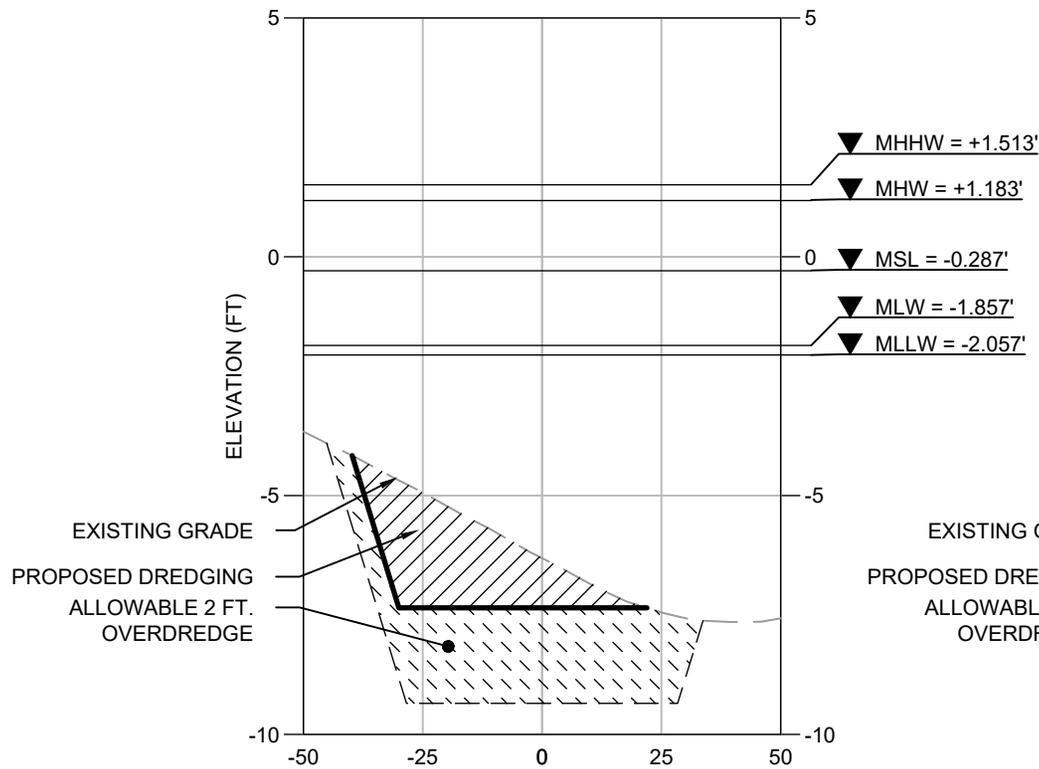


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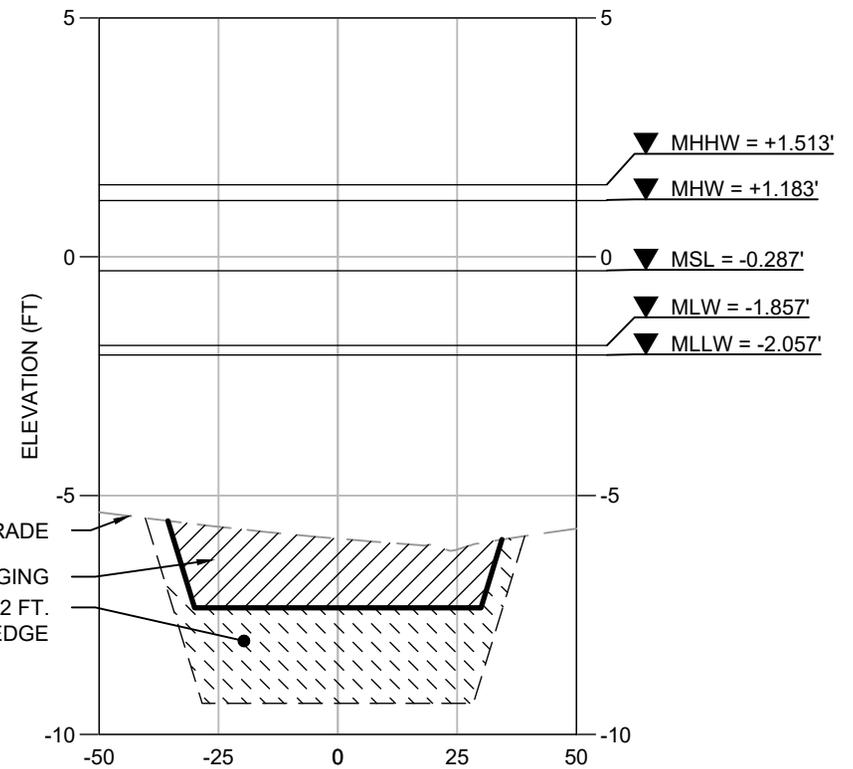
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TOWN OF NANTUCKET NANTUCKET COUNTY, NANTUCKET, MA	
HITHER CREEK CROSS SECTION	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
	SHEET 9

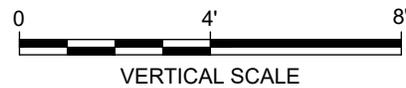
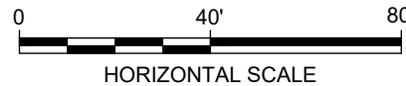


SECTION AT 27+28 **3**



SECTION AT 42+90 **4**

PROGRESS PRINT
1-7-2026



TOWN OF NANTUCKET
NANTUCKET COUNTY, NANTUCKET, MA

**HITHER CREEK
CROSS SECTION**

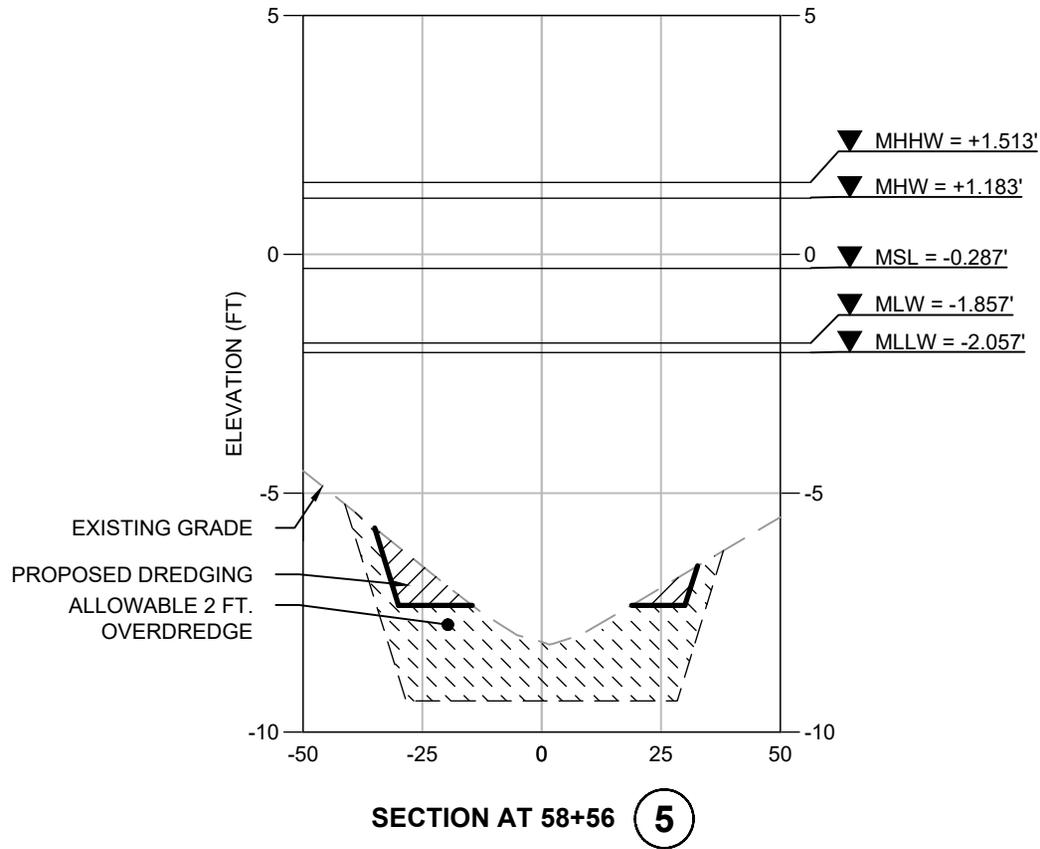
ARCADIS PROJECT NO.
30145716

ARCADIS, US, INC.
500 Edgewater Drive
Suite 511, 1880
Wakefield, MA 01880

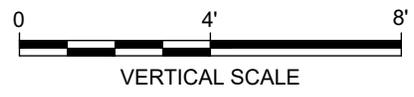
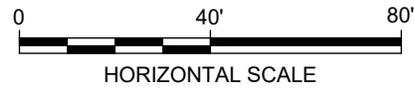
DATE : JANUARY 2026



SHEET
10



PROGRESS PRINT
1-7-2026



TOWN OF NANTUCKET NANTUCKET COUNTY, NANTUCKET, MA	
HITHER CREEK CROSS SECTION	
ARCADIS PROJECT NO. 30145716	ARCADIS, US, INC. 500 Edgewater Drive Suite 511, 1880 Wakefield, MA 01880
DATE : JANUARY 2026	
	SHEET 11

Attachment L

Town Notice

PUBLIC NOTICE OF ENVIRONMENTAL REVIEW

PROJECT: Polpis Harbor and Hither Creek 10 Year Maintenance Dredging Project

LOCATION: Polpis Harbor and Hither Creek, Nantucket, MA (41.30445, -70.021136 & 41.274393, -70.201726)

PROPONENT: Town of Nantucket

The undersigned is submitting an Environmental Notification Form (“ENF”) to the Secretary of Energy & Environmental Affairs on or before February 1st, 2026.

This will initiate review of the above project pursuant to the Massachusetts Environmental Policy Act (“MEPA,” M.G.L. c. 30, ss. 61-62L). Copies of the ENF may be obtained from: Devon McKave (agent, Arcadis U.S., Inc.), reachable at devon.mckave@arcadis.com or +1 617-795-4286.

Electronic copies of the ENF are also being sent to the Conservation Commission and Planning Board of Town of Nantucket.

The Secretary of Energy & Environmental Affairs will publish notice of the ENF in the Environmental Monitor, receive public comments on the project, and then decide if an Environmental Impact Report is required. A site visit and/or remote consultation session on the project may also be scheduled. All persons wishing to comment on the project, or to be notified of a site visit and/or remote consultation session, should email MEPA@mass.gov or the MEPA analyst listed in the Environmental Monitor. Requests for language translation or other accommodations should be directed to the same email address. Mail correspondence should be directed to the Secretary of Energy & Environmental Affairs, 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, Attention: MEPA Office, referencing the above project.

By Town of Nantucket

Attachment M

MEPA Distribution List

MEPA Distribution List

Agency	Email Address	Address
Massachusetts Environmental Policy Act (MEPA) Office	MEPA@mass.gov	MEPA Office 100 Cambridge Street, Suite 900 Boston, MA 02114
Department of Environmental Protection, Boston Office	helena.boccardo@mass.gov	Commissioner's Office One Winter Street Boston, MA 02108
Department of Environmental Protection, Appropriate Regional Office and to each program from which a permit will be sought	Sean.Gonsalves@mass.gov	DEP/Western Regional Office Attn: MEPA Coordinator State House West - 4th floor 436 Dwight Street Springfield, MA 01103
	george.zoto@mass.gov jonathan.hobill@mass.gov	DEP/Southeastern Regional Office Attn: MEPA Coordinator 20 Riverside Drive Lakeville, MA 02347
	andrea.briggs@mass.gov	DEP/Central Regional Office Attn: MEPA Coordinator 8 New Bond Street Worcester, MA 01606
	john.d.viola@mass.gov	DEP/Northeast Regional Office Attn: MEPA Coordinator 150 Presidential Way Woburn, MA 01801
Massachusetts Department of Transportation - Boston	MassDOTPPDU@dot.state.ma.us	Public/Private Development Unit 10 Park Plaza, Suite #4150 Boston, MA 02116
Massachusetts Department of Transportation — District Office	Brian.Ducey@dot.state.ma.us	District #1 Attn: MEPA Coordinator 270 Main Street Lenox, MA 01240
	bao.lang@dot.state.ma.us garrett.postema@dot.state.ma.us	District #2 Attn: MEPA Coordinator 811 North King Street Northampton, MA 01060
	Kevin.R.Robenhymer@dot.state.ma.us Eric.Nascimento@dot.state.ma.us	District #3 Attn: MEPA Coordinator 499 Plantation Parkway Worcester, MA 01605
	DOT-DL-D4-Planning@dot.state.ma.us	District #4 Attn: MEPA Coordinator 519 Appleton Street Arlington, MA 02476

	Cindy.McConarty@dot.state.ma.us	District #5 Attn: MEPA Coordinator 1000 County Street Taunton, MA 02780
	michael.garrity@dot.state.ma.us	District #6 Attn: MEPA Coordinator 185 Kneeland Street Boston, MA 02111
Massachusetts Historical Commission	Mail a hard copy of the filing to MHC.	The MA Archives Building 220 Morrissey Boulevard Boston, MA 02125
Applicable Regional Planning Agency: Nantucket Planning & Economic Development Commission (NP&EDC)	lsnell@nantucket-ma.gov	16 Broad Street Nantucket, MA 02554
Town of Nantucket	townadministration@nantucket-ma.gov	City Council 16 Broad Street Nantucket, MA 02554
	mtrudel@nantucket-ma.gov	Planning Board 2 Fairgrounds Road Nantucket, MA 02554
	wdellerba@nantucket-ma.gov	Conservation Commission 131 Pleasant Street 2 nd Floor Nantucket, MA

If the Project is located within five miles of an Environmental Justice Population	EEA Environmental Justice Director MEPA-EJ@mass.gov	MEPA Office Attn: EEA EJ Director 100 Cambridge Street, Suite 900 Boston, MA 02144
If the project is in a Coastal Zone Community	sean.duffey@mass.gov patrice.bordonaro@mass.gov	Coastal Zone Management Attn: Project Review Coordinator 100 Cambridge Street, Suite 900 Boston, MA 02144
	DMF.EnvReview-South@mass.gov	From Cohasset to Rhode Island Border OMF — South Shore Attn: Environmental Reviewer 836 South Rodney French Blvd New Bedford, MA, 02744
	boh@nantucket-ma.gov	Department/Board of Health 131 Pleasant Street Nantucket, MA 02554

<p>If the Project site is within or contains designated significant or estimated habitat, or priority sites of endangered or threatened species or species of special concern in accordance with the Massachusetts Endangered Species Act</p>	<p>melany.cheeseman@mass.gov emily.holt@mass.gov</p>	<p>Natural Heritage and Endangered Species Program Division of Fisheries & Wildlife 1 Rabbit Hill Road Westborough, MA 01581</p>
<p>If the Project is located within 5 miles of an Environmental Justice Population</p>	<p>DPH Director Rmiramontes@nantucket-ma.gov</p>	<p>Department of Public Health 131 Pleasant Street 1st Floor Nantucket, MA 02554</p>

Any other Agency from which an Agency Action (including Permits, Land Transfers and Financial Assistance) may be required for the Project

Regional Planning Agency Distribution List

Find your Regional Planning Agency (RPA) [here](#) by clicking on the statewide map at the bottom of the webpage.

Regional Planning Agency	Email and/or Mailing Address
Berkshire Regional Planning Commission (BRPC)	tmatuszko@berkshireplanning.org mprovencher@berkshireplanning.org OfficeAssistant@berkshireplanning.org
Cape Cod Commission (CCC)	kseatori@capecodcommission.org regulatory@capecodcommission.org
Central Massachusetts Regional Planning Commission (CMRPC)	mepafiling@cmrpc.org
Franklin Regional Council of Governments (FRCOG) 12 Olive Street, Suite 2 Greenfield, MA 01301	Jessica Atwood and 1 hard copy (Attn: see address to the left) jatwood@frcog.org kmacphee@frcog.org adonlon@frcog.org
Martha's Vineyard Commission (MVC)	turner@mvcommission.org morrison@mvcommission.org
Merrimack Valley Planning Commission (MVPC)	info@mvpc.org
Metropolitan Area Planning Council (MAPC)	mpillsbury@mapc.org afelix@mapc.org
Montachusett Regional Planning Commission (MRPC)	mrpc@mrpc.org
Nantucket Planning and Economic Development Commission (NPEDC)	avorce@nantucket-ma.gov
Northern Middlesex Council of Governments (NMCOG) 672 Suffolk Street, Suite 100 Lowell, MA 01854	mtenhoff@nmcog.org jraitt@nmcog.org and 1 hard copy (Attn Jennifer Raitt; see address to the left)
Pioneer Valley Planning Commission (PVPC) 60 Congress Street, 1 st Floor Springfield, MA 01104-3419	gmroux@pvpc.org and 1 hard copy (Attn Gary Roux; see address to the left)
Old Colony Planning Council (OCPC)	mwaldron@ocpcrpa.org kmowatt@ocpcrpa.org ckilmer@ocpcrpa.org
Southeastern Regional Planning and Economic Development District (SRPEDD)	jwalker@srpedd.org gking@srpedd.org dbelknap@srpedd.org Ideoliveira@srpedd.org lestrela@srpedd.org

Attachment N

RMAT Climate Resilience Design Standards Report

Climate Resilience Design Standards Tool Project Report

Hither Creek Maintenance Dredging

Date Created: 7/18/2025 3:47:45 PM

Created By: kimberly.rogers

Date Report Generated: 7/18/2025 8:04:37 PM

Tool Version: Version 1.4

Project Contact Information: Vincent Murphy (vmurphy@nantucket-ma.gov)

Project Summary

[Link to Project](#)

Estimated Capital Cost: \$350000.00

End of Useful Life Year: 2036

Project within mapped Environmental Justice neighborhood: No

Ecosystem Service	Scores
Benefits	
Project Score	Moderate
Exposure	
Sea Level Rise/Storm Surge	High Exposure
Extreme Precipitation - Stormwater Flooding	High Exposure
Extreme Precipitation - Riverine Flooding	Not Exposed
Extreme Heat	Moderate Exposure



Asset Preliminary Climate Risk Rating

Number of Assets: 1

Summary

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Stormwater Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Navigation Channel	High Risk	High Risk	Low Risk	Moderate Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Navigation Channel	2030				
Extreme Precipitation					
Navigation Channel	2030				Tier 2
Extreme Heat					
Navigation Channel	2030		50th		Tier 2

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "High Exposure" because of the following:

- Located within the predicted mean high water shoreline by 2030
- Exposed to the 1% annual coastal flood event as early as 2030
- Historic coastal flooding at project site

Extreme Precipitation - Stormwater Flooding

This project received a "High Exposure" because of the following:

- Historic flooding at the project site
- No increase to impervious area
- Maximum annual daily rainfall is within 6 to 10 inches within the overall project's useful life
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "Not Exposed" because of the following:

- No historic riverine flooding at project site
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]
- Project is more than 500ft from a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "Moderate Exposure" because of the following:

- Less than 10% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site
- No tree removal
- < 10 day increase in days over 90 deg. F within project's useful life

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Navigation Channel

Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable for more than a day but less than a week after natural hazard event
- Less than 100,000 people would be directly affected by the loss/inoperability of the asset
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would be expected to result in minor impacts to people's health, including minor injuries or minor impacts to chronic illnesses
- Inoperability is likely to significantly impact other facilities, assets, or buildings and will likely affect their ability to operate
- Impact on natural resources will require remediation/rehabilitation with the inoperability of the asset

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Navigation Channel

Infrastructure

Sea Level Rise/Storm Surge

High Risk

Target Planning Horizon: 2030

Intermediate Planning Horizon: Not Applicable

Return Period: Not exposed to coastal flooding by 2070

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

The projected values, Standards, and Guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: APPLICABLE

[Methodology to Estimate Projected Values](#)

Projected Design Flood Velocity: APPLICABLE

[Methodology to Estimate Projected Values](#)

Projected Scour & Erosion: APPLICABLE

[Methodology to Estimate Projected Values](#)

Extreme Precipitation

High Risk

Target Planning Horizon: 2030

Return Period: No Return Period

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these

events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.

Applicable Design Criteria

Tiered Methodology: Tier 2

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Navigation Channel	2030	No Return Period	N/A	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat

Moderate Risk

Target Planning Horizon: 2030

Percentile: 50th Percentile

LIMITATIONS: The recommended standards are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the [Climate Projections Dashboard](#).

Applicable Design Criteria

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE

LIMITATIONS: The recommended Standards for Projected Average Annual/Summer/Winter Temperature are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the [Climate Projections Dashboard](#).

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE

LIMITATIONS: The recommended Standards for Projected Days per Year with Max Temp >95°F, >90°F, <32°F are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the [Climate Projections Dashboard](#).

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE

LIMITATIONS: The recommended Standards for Projected Number of Heat Waves Per Year and Average Heat Wave Duration are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the [Climate Projections Dashboard](#).

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Projected Heat Index: APPLICABLE

[Methodology to Estimate Projected Values](#) : Tier 2

Project Inputs

Core Project Information

Name:	Hither Creek Maintenance Dredging
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2036
Location of Project:	Nantucket
Estimated Capital Cost:	\$350,000
Who is the Submitting Entity?	City/Town Nantucket Vincent Murphy (Vmurphy@nantucket-ma.gov)
Is this project identified as a priority project in the Municipal Vulnerability Preparedness (MVP) plan or the local or regional Hazard Mitigation Plan (HMP)?	Yes
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	The Town of Nantucket is seeking regulatory approvals and associated permits to complete maintenance dredging for a period of ten years at Hither Creek on the Island of Nantucket with approximate coordinates at 41.274393, -70.201726. The objective of the proposed dredging is to restore and improve navigation for recreational and commercial boating, improve tidal flushing, and maintain access to public boat ramps, landings, mooring fields, boat marinas, and shellfish areas. Anticipated regulatory reviews required include MassDEP, Nantucket Conservation Commission, NHESP, MEPA, USACE, Ch 91 Waterways, and CZM Federal Consistency.

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project improves water quality
- ✓ Project protects fisheries, wildlife, and plant habitat
- ✓ Project protects land containing shellfish
- ✓ Project remediates existing sources of pollution
- ✓ Project provides recreation
- ✓ Project prevents pollution

Factors to Improve Output

- ✓ Incorporate nature-based solutions that may reduce storm damage
- ✓ Incorporate education and/or protect cultural resources as part of your project

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	Maybe
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	No
Improves water quality	Yes
Promotes decarbonization	No
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Yes
Remediates existing sources of pollution	Yes
Protects fisheries, wildlife, and plant habitat	Yes
Protects land containing shellfish	Yes
Provides pollinator habitat	No
Provides recreation	Yes
Provides cultural resources/education	Maybe

Project Climate Hazard Exposure

Is the primary purpose of this project ecological restoration? No

Does the project site have a history of coastal flooding?	Yes
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Yes
Does the project site have a history of riverine flooding?	No
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	No

Project Assets

Asset: Navigation Channel

Asset Type: Other

Asset Sub-Type: Other

Construction Type: Maintenance (critical repair)

Construction Year: 2026

Useful Life: 10

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.

Infrastructure may be inaccessible/inoperable for more than a day, but less than a week after natural hazard without consequences.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.

Impacts would be limited to local area and/or municipality

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.

Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?

No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?

Inoperability of the infrastructure would be expected to result in minor impacts to people's health, including minor injuries or minor impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?

There are no hazardous materials in the infrastructure

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?

Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?

Less than \$10 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.

No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?

Impact on natural resources will require remediation/rehabilitation

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?

Loss of infrastructure may reduce the ability to maintain some government services, while a majority of services will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?

Reduced morale and public support

Report Comments

N/A

Climate Resilience Design Standards Tool Project Report

Polpis Harbor Maintenance Dredging

Date Created: 7/14/2025 3:28:22 PM

Created By: kimberly.rogers

Date Report Generated: 7/18/2025 7:53:22 PM

Tool Version: Version 1.4

Project Contact Information: Vincent Murphy (vmurphy@nantucket-ma.gov)

Project Summary

[Link to Project](#)

Estimated Capital Cost: \$350000.00

End of Useful Life Year: 2036

Project within mapped Environmental Justice neighborhood: No

Ecosystem Service	Scores
Benefits	
Project Score	Moderate
Exposure	
Sea Level Rise/Storm Surge	High
Extreme Precipitation - Stormwater Flooding	High
Extreme Precipitation - Riverine Flooding	Not Exposed
Extreme Heat	Moderate



Asset Preliminary Climate Risk Rating

Number of Assets: 1

Summary

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Stormwater Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Navigation Channel	High Risk	High Risk	Low Risk	Moderate Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Navigation Channel	2030				
Extreme Precipitation					
Navigation Channel	2030				Tier 2
Extreme Heat					
Navigation Channel	2030		50th		Tier 2

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "High Exposure" because of the following:

- Located within the predicted mean high water shoreline by 2030
- Exposed to the 1% annual coastal flood event as early as 2030
- Historic coastal flooding at project site

Extreme Precipitation - Stormwater Flooding

This project received a "High Exposure" because of the following:

- Historic flooding at the project site
- No increase to impervious area
- Maximum annual daily rainfall is within 6 to 10 inches within the overall project's useful life
- Existing impervious area of the project site is less than 10%

Extreme Precipitation - Riverine Flooding

This project received a "Not Exposed" because of the following:

- No historic riverine flooding at project site
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]
- Project is more than 500ft from a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "Moderate Exposure" because of the following:

- Less than 10% of the existing project site has canopy cover
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site
- No tree removal
- < 10 day increase in days over 90 deg. F within project's useful life

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Navigation Channel

Primary asset criticality factors influencing risk ratings for this asset:

- Asset may be inaccessible/inoperable for more than a day but less than a week after natural hazard event
- Less than 100,000 people would be directly affected by the loss/inoperability of the asset
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would be expected to result in minor impacts to people's health, including minor injuries or minor impacts to chronic illnesses
- Inoperability is likely to significantly impact other facilities, assets, or buildings and will likely affect their ability to operate
- Impact on natural resources will require remediation/rehabilitation with the inoperability of the asset

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Navigation Channel

Infrastructure

Sea Level Rise/Storm Surge

High Risk

Target Planning Horizon: 2030

Intermediate Planning Horizon: Not Applicable

Return Period: Not exposed to coastal flooding by 2070

LIMITATIONS: The recommended Climate Resilience Design Standards for the Sea Level Rise / Storm Surge Design Criteria are based on the user drawn polygon and relationships as defined in the Supporting Documents. The projected values provided through the Tool are based on the Massachusetts Coast Flood Risk Model (MC-FRM) outputs as of 9/13/2021, which included GIS-based data for three planning horizons (2030, 2050, 2070) and six return periods (0.1%, 0.2%, 0.5%, 1%, 2%, 5%). These values are projections based on assumptions as defined in the model and the LiDAR used at the time. For additional information on the MC-FRM, review the additional resources provided on the Start Here page.

The projected values, Standards, and Guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: APPLICABLE

[Methodology to Estimate Projected Values](#)

Projected Design Flood Velocity: APPLICABLE

[Methodology to Estimate Projected Values](#)

Projected Scour & Erosion: APPLICABLE

[Methodology to Estimate Projected Values](#)

Extreme Precipitation

High Risk

Target Planning Horizon: 2030

Return Period: No Return Period

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these

events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.

Applicable Design Criteria

Tiered Methodology: Tier 2

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Navigation Channel	2030	No Return Period	N/A	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat

Moderate Risk

Target Planning Horizon: 2030

Percentile: 50th Percentile

LIMITATIONS: The recommended standards are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the [Climate Projections Dashboard](#).

Applicable Design Criteria

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE

LIMITATIONS: The recommended Standards for Projected Average Annual/Summer/Winter Temperature are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the [Climate Projections Dashboard](#).

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE

LIMITATIONS: The recommended Standards for Projected Days per Year with Max Temp >95°F, >90°F, <32°F are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the [Climate Projections Dashboard](#).

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE

LIMITATIONS: The recommended Standards for Projected Number of Heat Waves Per Year and Average Heat Wave Duration are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the [Climate Projections Dashboard](#).

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): NOT APPLICABLE

Projected Heat Index: APPLICABLE

[Methodology to Estimate Projected Values](#) : Tier 2

Project Inputs

Core Project Information

Name:	Polpis Harbor Maintenance Dredging
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2036
Location of Project:	Nantucket
Estimated Capital Cost:	\$350,000
Who is the Submitting Entity?	City/Town Nantucket Vincent Murphy (Vmurphy@nantucket-ma.gov)
Is this project identified as a priority project in the Municipal Vulnerability Preparedness (MVP) plan or the local or regional Hazard Mitigation Plan (HMP)?	Yes
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Permitting
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	Yes
Brief Project Description:	The Town of Nantucket is seeking regulatory approvals and associated permits to complete maintenance dredging for a period of ten years at Polpis Harbor on the Island of Nantucket with approximate coordinates at 41.304457, -70.021136. The objective of the proposed dredging is to restore and improve navigation for recreational and commercial boating, improve tidal flushing, and maintain access to public boat ramps, landings, mooring fields, boat marinas, and shellfish areas. Anticipated regulatory reviews required include MassDEP, Nantucket Conservation Commission, NHESP, MEPA, USACE, Ch 91 Waterways, and CZM Federal Consistency.

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project improves water quality
- ✓ Project protects fisheries, wildlife, and plant habitat
- ✓ Project protects land containing shellfish
- ✓ Project remediates existing sources of pollution
- ✓ Project provides recreation
- ✓ Project prevents pollution

Factors to Improve Output

- ✓ Incorporate nature-based solutions that may reduce storm damage
- ✓ Incorporate education and/or protect cultural resources as part of your project

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	No
Reduces storm damage	Maybe
Recharges groundwater	No
Protects public water supply	No
Filters stormwater using green infrastructure	No
Improves water quality	Yes
Promotes decarbonization	No
Enables carbon sequestration	No
Provides oxygen production	No
Improves air quality	No
Prevents pollution	Yes
Remediates existing sources of pollution	Yes
Protects fisheries, wildlife, and plant habitat	Yes
Protects land containing shellfish	Yes
Provides pollinator habitat	No
Provides recreation	Yes
Provides cultural resources/education	Maybe

Project Climate Hazard Exposure

Is the primary purpose of this project ecological restoration? No

Does the project site have a history of coastal flooding?	Yes
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	Yes
Does the project site have a history of riverine flooding?	No
Does the project result in a net increase in impervious area of the site?	No
Are existing trees being removed as part of the proposed project?	No

Project Assets

Asset: Navigation Channel

Asset Type: Other

Asset Sub-Type: Other

Construction Type: Maintenance (critical repair)

Construction Year: 2026

Useful Life: 10

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.

Infrastructure may be inaccessible/inoperable for more than a day, but less than a week after natural hazard without consequences.

Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.

Impacts would be limited to local area and/or municipality

Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.

Less than 100,000 people

Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

Will the infrastructure reduce the risk of flooding?

No

If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?

Inoperability of the infrastructure would be expected to result in minor impacts to people's health, including minor injuries or minor impacts to chronic illnesses

If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?

There are no hazardous materials in the infrastructure

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?

Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?

Less than \$10 million

Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.

No

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?

Impact on natural resources will require remediation/rehabilitation

If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?

Loss of infrastructure may reduce the ability to maintain some government services, while a majority of services will still exist

What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?

Reduced morale and public support

Report Comments

N/A