AGENDA

Monday

November 6, 2017

TOWN OF EASTHAM
BOARD OF SELECTMEN AGENDA
Monday, November 6, 2017
5:00 PM

Location: Earle Mountain Room

I. PUBLIC/SELECTMEN INFORMATION

II. APPOINTMENTS (discussion & vote may be taken)

5:05 PM	Cape Cod Commercial Fishermen's Alliance's Request for Support re Midwater Trawling – Amanda Cousart
5:20 PM	EMT of the Year Award from Cape & Islands EMS to Firefighter EMT Donald Watson – Chief Kent Farrenkopf
5:30 PM	Flood Insurance Rate Map (FIRM) – Paul Lagg, Town Planner

(Note: Other than public hearings, all times are approximate and items may be taken out of order.)

III. LICENSING

1. Transient Vendor Permits – Turnip Festival, Saturday, November 18, 2017

IV. ADMINISTRATIVE MATTERS

A. Action/Discussion (votes may be taken)

1. Sign Bond for Tri-Town Septage Treatment Plant Demolition and Restoration – Mike Lorenco
2. Request to Store a Temporary Travel Trailer on Property while House under Renovation
3. Notice of Intent to Sell 405 Higgins Road
4. Committee Resignation – Susan J. Pellowe, Cultural Council
5. Committee Appointment – Janna Drake, Finance Committee
6. Timothy Smith Loan Renewal Application – Travor Radke
7. Eastham 2020 Process
8. Policy on Student Board Members – Appointed & Voting Rights
9. Strategic Planning Update
10. Vote to Refer Marijuana Bylaw Moratorium to the Planning Board for a Public Hearing

V. TOWN ADMINISTRATOR'S REPORT

VI. OTHER BUSINESS

Discussion of topics not reasonably anticipated by the Chair 48 hours before the meeting

VII. EXECUTIVE SESSION

1. To discuss strategy with respect to staff reorganization and water position when an open meeting may have a detrimental effect on the negotiating position of the public body and the chair is so declaring.

2. To discuss strategy with respect to possible land lease when an open meeting may have a detrimental effect on the litigating and negotiating position of the public body and the chair is so declaring.

3. To discuss strategy with respect to the current proposal submitted by SCG Development Partners when an open meeting may have a detrimental effect on the negotiating position of the public body and the Chair so declares.

Upcoming Meetings

Wednesday, November 8, 2017	*2:30 PM*	*Small Meeting Room*	*Work Session*
Monday, November 13, 2017	*5:00 PM*	*Earle Mountain Room*	*Joint Meeting w FinCom*
Monday, November 20, 2017	*5:00 PM*	*Earle Mountain Room*	*Regular Session*
Wednesday, November 22, 2017	*2:30 PM*	*Small Meeting Room*	*Work Session*

The listing of matters includes those reasonably anticipated by the Chair that may be discussed at the meeting. Not all items listed may in fact be discussed and other items not listed may be brought up for discussion to the extent permitted by law.

This meeting is video recorded and broadcast over Local Access Channel 18 and on the Town website at www.eastham-ma.gov.

If you are deaf or hard of hearing or are a person with a disability who requires an accommodation, contact Laurie Gillespie-Lee, 5900 x3207

APPOINTMENTS

Gillespie-Lee, Laurie

From: Jacqueline Beebe <jbeebe@eastham-ma.gov>
Sent: Wednesday, October 4, 2017 8:53 AM
To: Gillespie-Lee, Laurie
Subject: FW: Request to be added to Agenda
Attachments: LD Template Town_v2 general.docx; Midwater Trawl Buffer Zone Fact Sheet Final.pdf; herringstory_oct.pdf

Can you save this for next agenda. Thanks, Jacqui

From: Amanda Cousart [mailto:amanda@capecodfishermen.org]
Sent: Tuesday, October 3, 2017 11:49 AM
To: Jacqueline Beebe <jbeebe@eastham-ma.gov>
Subject: Request to be added to Agenda

Good Morning-
My name is Amanda Cousart, and I am reaching out on behalf of the Cape Cod Commercial Fishermen's Alliance to request to be added to the agenda for the next meeting of your Board of Selectmen.

The reason we are reaching out is because we are asking for support on the issue of localized depletion of resources as a result of a practice called midwater trawling, a gear type used to fish for Atlantic herring. The gear is enormous and scoops up everything in its patch, leading to a large amount of bycatch. This bycatch can include river herring, tuna, cod, striper and even marine mammals. The vessels often come very close to shore near Cape Cod, and essentially wipe out the forage fish so vital to our ecosystem. This undermines our towns (many of whom have spent millions of dollars to restore river herring runs) and fishermen (who rely on an abundance of forage fish to catch their targeted species).

We are advocating for the creation of a buffer zone that would exclude trawlers from the waters around Cape Cod. Our ask of the Board is to draft a letter of support. Our template (attached) is very general, and we encourage it to be personalized to reflect your town and the impacts you may have felt, whether that be financial burdens, loss of revenue from fewer forage fish, or loss of a unique part of Cape Cod's historical culture.

We've also attached a recent article on the topic. I am happy to talk more about the issue, and can be reached via email or phone. Thank you.

Best,

Amanda Cousart
Policy Analyst and Community Organizer

Cape Cod Commercial Fishermen's Alliance
1566 Main Street, Chatham, MA 02633
Small Boats. Big Ideas.
amanda@capecodfishermen.org | (508) 945-2432 x105 | capecodfishermen.org

Cape Cod calls on council to protect Atlantic herring

By Doreen Leggett

doreen@capecodfishermen.org

Kurt Martin was in the Time Bandit off Nauset Beach in Orleans when he saw two midwater trawls fishing in the distance. The 150-foot boats moved methodically, steaming about a quarter mile apart, towing an enormous net between them that can rake up a school of a million or more Atlantic Herring in one pass.

Not too long after, Martin saw a dead humpback whale floating in the water. Not a mark on it.

The cause of death was never determined, but Martin, and others who make their living on the sea, have strong suspicions it was trapped underwater. The nets are as long as football fields after all, and humpbacks aren't fish.

"It drowned," he said.

Martin, a highly-regarded lobsterman, is so frustrated with the industrial trawlers' presence just off the Cape that he refuses to

even buy herring as bait for his lobster traps. He uses sea robins, menhaden and skate.

Dead whales are not Martin's only concern. He and many other fishermen have a litany of issues with the giant vessels that lay waste to the nearshore ecosystem.

Because the boats remove so many bait fish, other species that feed on them – cod, haddock, tuna – disappear as well. The effects of the paired trawlers also reverberate far inland. Hundreds of thousands of river herring trying to return to our towns' traditional alewife runs and ponds are caught as bycatch in the maws of trawlers, threatening an already fragile population, undermining town investments and the work of scores of volunteers trying to bring the herring runs back to life.

To help fix what has become a broken food chain, The Cape Cod Commercial Fisherman's Alliance is working to establish a buffer zone along the backside of the Cape to push large-scale trawlers offshore. The trawlers wouldn't be banned. They would just fish farther away.

"They can go fish anywhere they want; they have 150-foot boats. I've got a 34-foot boat; I can't go 150 miles offshore to catch tuna. I gotta be close to shore," said Bruce Peters, of Orleans, who fishes for blue tuna and striped bass as captain of the Marilyn S.

Pushing the fleet farther from the shore would reverse the trend of fewer and fewer herring locally, but still allow industrial trawlers to catch the limits allowed by law.

"Herring are one of several very important bait fish, and fishermen on the Cape have been concerned for more than a decade that there has been a steady decline," said John Pappalardo, CEO of the Fishermen's Alliance.

Ted Ligenza, the captain of the Reine Marie, has been concerned since the 1990s. He was out fishing Great Hill, off Chatham, when he saw the big trawlers for the first time. He remembers looking down at his fish finder.

"There was dogfish, herring, codfish, and pollock on my sounding machine," the Chatham resident said. "The whole sounding machine had fish on it, from bottom to top."

Ligenza is one of the few fishermen who still uses hooks and a handline to catch fish. His hooks float just above the ocean floor so he thought that he would be able to fish the area after the big boats pulled out. They were towing nets and the bottom was more than a 100-feet below the surface.

Ligenza was wrong. There was nothing left when mid-water trawlers left.

"I was soon to learn that if they were towing, nothing would be there. They are basically catching everything ... We didn't realize how bad it was going to be," he said.

In the coming months, Council members have the opportunity to fix the problem. They will be discussing "Amendment 8" to the Atlantic Herring Fishing Management Plan. For the first time in management history, new rules could require managers to account for the role of herring in the entire ecosystem. The plan is also supposed to address so-called "localized depletion," a major worry on the Cape.

Council members are looking at managing fish by seeing how they fit into the overall puzzle of the natural world, not only as catch for human use.

That works for Peters. Scientists should find out what tuna, cod, stripers, even migrating terns need. "Once you figure out that allotment, then dole out what man needs," Peters said.

Buffer zones have worked before. In 2007, the Council created a no-fish zone for mid-water trawlers in the inshore waters of the Gulf of Maine. That nine-month prohibition has allowed marine life to rebound dramatically.

Ligenza is confident that if the trawlers were pushed farther offshore, local waters would begin to recover. The Fishermen's Alliance agrees.

"We have options and opportunities," said Pappalardo. "We are in a good place."

Ligenza appreciates the optimism, and hopes we will give the herring a chance to come back to the near shore. He has a fishing career that spans 40 years and the thing that bothers

him most about the trawlers is they may have denied others a chance to make their living on the water.

"The saddest thing is I have a 35-year-old son who loves to fish," he said.

PHOTO: DAVID HILLS, WWW.FISHYPICTURES.COM

Moving Midwater Trawlers Offshore

"Letting a fishery of this magnitude into the inshore area to take that biomass of food out of the ecosystem when there are so many species that are in rebuilding stages is excessive."

"The main sustenance for many of the fish we catch is herring. Midwater trawlers are too efficient; the fish don't have a chance. When they fish close to shore, they take away the food, and the fish we target leave our waters."

Fishermen's Commentary

Taken from letters submitted by commercial fishermen to the New England Fishery Management Council.

GIANT GEAR, GIANT CONSEQUENCES

Sea herring are an important source of food for whales, birds and larger fish. The industrial midwater trawl fleet that targets herring often fishes close to shore. These industrial-scale ships are easily recognized because they usually fish in pairs, towing a small-mesh net the size of a football field between them that catches everything in its path.

Problem 1: Bycatch

While these vessels fish for sea herring, they indiscriminately catch other fish, including striped bass, juvenile haddock, river herring and sometimes even marine mammals. This is called bycatch, and it either gets dumped overboard dead, or mixed in with herring sold as bait.

Problem 2: Fishery Impacts

When midwater trawlers remove entire schools of herring from nearshore areas, cod, tuna, and other fish have to move offshore in search of food. Not only does this disrupt the entire marine food chain, but it leaves small-boat fishermen with nothing to bring to shore for our dinner plates.

Our Solution

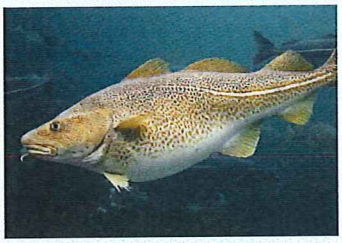
We want these boats to move farther offshore and protect Cape Cod's fish, bird and marine animal populations. Then, there will be abundant herring in our coastal waters for other fish to eat, and our small-boat, coastal fisheries can thrive.

Atlantic Bluefin Tuna

These impressive predators migrate thousands of miles across the Atlantic Ocean to feed on schools of herring in Cape Cod's coastal waters. When the midwater trawlers clean out inshore areas of herring, the tuna leave to find food elsewhere.

Juvenile Haddock

Young haddock are the same size as herring and are common bycatch for midwater trawlers. When midwater trawlers catch baby haddock, they take away from haddock fishermen's future ability to make a living.



Atlantic Cod

Lack of herring could also be impacting the ability of cod and other groundfish to rebuild their populations. For cod populations to increase, they'll need abundant food. If there are no forage fish for codfish to eat in inshore waters, they may never return there.

Striped Bass

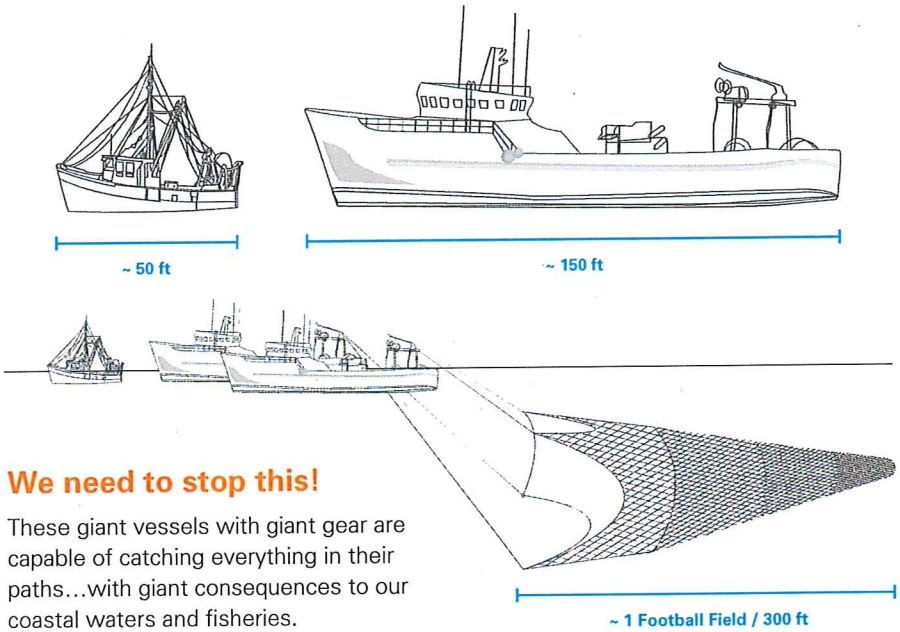
Commercial and recreational fishermen have reported many malnourished stripers in recent years. Stomach contents that used to be full of herring are now empty, and fishermen are concerned.

PHOTOS (FROM LEFT): BLUEFIN TUNA: © KEITH ELLENBOGEN / OCEANA; COD: DIETER CRAASMAN; STRIPED BASS: STEVEN G. JOHNSON, OWN WORK, CC BY-SA 3.0, HTTPS.COMMONS.WIKIMEDIA.ORGWINDEX.PHPCURID=4573292.JPG.

What is the solution?

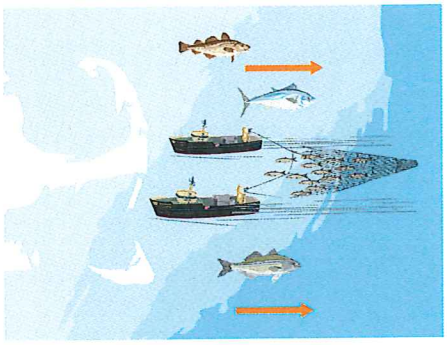
- Establish a buffer zone along the backside of Cape Cod to eliminate large-scale industrial herring fishing in nearshore waters.
- In 2007, the New England Fishery Management Council created a buffer zone prohibiting industrial midwater trawling for herring in the inshore waters of the Gulf of Maine for nine months each year. Marine life has rebounded dramatically because of this buffer zone.

Local Trawler vs. Midwater Trawler



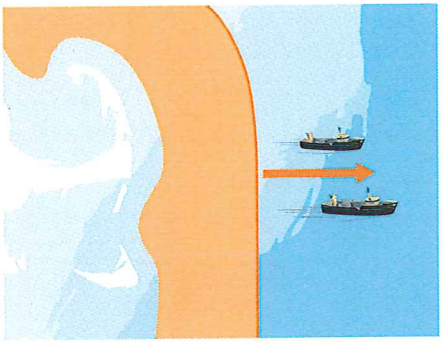
We need to stop this!

These giant vessels with giant gear are capable of catching everything in their paths…with giant consequences to our coastal waters and fisheries.



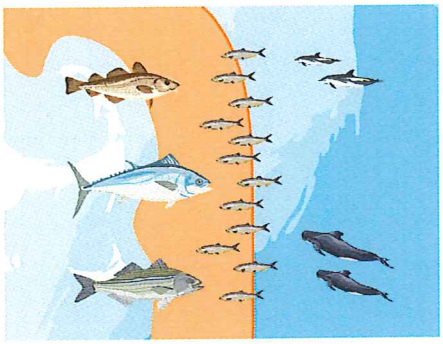
Midwater trawlers remove forage fish, leaving little for other animals to eat.

A healthy, balanced ecosystem is supported by an abundance of bait fish such as herring.



Small-boat fishermen are working hard to create buffer zones to prevent this.

These areas would be "no-midwater-trawl zones," closed to industrial fishing operations, but open to small-boat fishermen.



Pushing the midwater trawl fleet offshore will help Cape Cod return to a healthy ecosystem.

This is an important step in improving Cape Cod's marine life and rebuilding inshore fisheries.

GET INVOLVED!

Help protect herring in our coastal waters so other fish have food to eat and our small-boat fisheries can thrive.

Join our fight to push the midwater trawl fleet offshore. This is critical to the future of all fisheries; now is the time to get out there and tell the Council and NOAA Fisheries how important this is.

Contact the Fishermen's Alliance about upcoming meetings, opportunities for comments and public hearings at 508.945.2432 or email info@capecodfishermen.org

CAPE COD COMMERCIAL FISHERMEN'S ALLIANCE

1566 Main Street, Chatham, MA 02633
508.945.2432 info@capecodfishermen.org
www.capecodfishermen.org

Thomas A. Nies, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950
Fax: (978) 465-3116

Date, 2017

Attn: Atlantic Herring Localized Depletion Alternative

Dear Mr. Nies,
Thank you for the opportunity to comment on Amendment 8 to the Atlantic herring fishery management plan. The Town of [Your Town] and nearby communities have relied upon the abundance of herring and other forage fish to support commercial and recreation fisheries for hundreds of years, and are deeply concerned that the depletion of forage species has impacted the previously abundant resources in our region. The communities on the Cape depend on a healthy ecosystem and a vibrant economy, and herring is at the heart of each. Now, midwater trawlers are breaking our local food web by removing millions of pounds of herring and in turn harming everything from cod fishermen to whale boat operators. Year after year, [volunteers/natural resource officers] observe and report low numbers of returning river herring at the runs [location] despite more than $XX million in restoration projects to date. It has become increasingly apparent to us that the issue goes beyond our own spawning runs into the nearshore areas around the entire Cape. To protect the peninsula, we fully support the New England Fishy Management Council's (Council) efforts to establish a localized depletion alternative that creates a no-fishing zone and protects the inshore waters near Cape Cod from the impacts of midwater trawling by acknowledging the role of Atlantic and River Herring in the ecosystem.

Herring and all forage fish are the basis of a healthy, robust ecosystem and are necessary for profitable fisheries both in our towns and in the waters where many of our residents fish, both commerciall and recreationally. Unfortunately, the significant decline in numbers of river herring, which are caught as bycatch by the midwater trawl fleet, have resulted in a statewide moratorium of harvest in our fresh waters. To put it simply, the residents of Cape Cod feel the effects of sea and river herring being taken from nearshore waters, are penalized for harvesting, posessing or selling it, yet the industrialized fleets are not. Cape Cod midwater trawls are authorized to land more than 32 metric tons of river herring/shad, and our residents are probited from the fishery. A bycatch amount that nearly doubled last year.

Finally, in addition to the benefits that would be derrived to species we manage in [Your Town] and other towns, we recognized that the work done to develop a buffer zone in the nearshore regions around Cape Cod represents an important step in the regional transition to an ecosystem based fisheries management approach. The Council has advocated for the switch to EBFM over the last decade and Amendment 8 will provide the Council with the opportunity to identify the path that will get us there. We urge the Council to consider the big picture throughout this process, and to consider input from the public to achieve the best possible outcome, starting with establishing a buffer zone around Cape Cod.

We look forward to continuing our work to support the Council and the agency to advance these important developments in fisheries management and look forward to your upcoming decision.

Sincerely,

[Your Name(s)]
Town Of [Your Town], Board of Selectman

Federal Emergency Management Agency

Washington, D.C. 20472

September 8, 2017

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable William O'Shea
Chairman, Town of Eastham
Board of Selectmen
2500 State Highway
Eastham, MA 02642

IN REPLY REFER TO:
Case No.: 16-01-2154P
Community Name: Town of Eastham, MA
Community No.: 250006
Effective Date of
This Revision: **September 8, 2017**

Dear Mr. O'Shea:

The Flood Insurance Rate Map (FIRM) for your community has been revised by this Letter of Map Revision (LOMR). Additional documents are enclosed that provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document.

If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Boston, Massachusetts, at (617) 832-4761, or the FEMA Map Information eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at https://www.fema.gov/national-flood-insurance-program.

Sincerely,

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

ADMINISTRATION
SEP 15 2017
RECEIVED

List of Enclosures:

Letter of Map Revision Determination Document
Attachment to LOMR 16-01-2154P
44 CFR Paragraph 60.3(b)(4) of the NFIP regulations
LiMWA Fact Sheet

cc: Ms. Jacqueline Beebe
Administrator, Town of Eastham

Mr. Jack Yunits, Jr.
Administrator, Barnstable County

Ms. Joy Duperault, CFM
Director, Flood Hazard Management Program
State NFIP Coordinator and Hazard Mitigation Officer
Department of Conservation and Recreation,
Office of Water Resources

Mr. Bruce K. Carlisle
Director,
Massachusetts Office of Coastal Zone Management

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COUNTY	Barnstable County Massachusetts	NO PROJECT	LiMWA UPDATE
IDENTIFIER	LiMWA Updates For Massachusetts	APPROXIMATE LATITUDE AND LONGITUDE: 41.668, -69.949 SOURCE: USGS QUADRANGLE DATUM: NAD 83	

FLOODING SOURCE AND REACH DESCRIPTION

Atlantic Ocean - the entire coastline within Barnstable County

COMMUNITIES WITHIN BARNSTABLE COUNTY AFFECTED BY THIS REQUEST

CID Number: 250001	Name: Town of Barnstable	CID Number: 250009	Name: Town of Mashpee
CID Number: 255210	Name: Town of Bourne	CID Number: 250010	Name: Town of Orleans
CID Number: 250003	Name: Town of Brewster	CID Number: 255218	Name: Town of Provincetown
CID Number: 250004	Name: Town of Chatham	CID Number: 250012	Name: Town of Sandwich
CID Number: 250005	Name: Town of Dennis	CID Number: 255222	Name: Town of Truro
CID Number: 250006	Name: Town of Eastham	CID Number: 250014	Name: Town of Wellfleet
CID Number: 255211	Name: Town of Falmouth	CID Number: 250015	Name: Town of Yarmouth
CID Number: 250008	Name: Town of Harwich	CID Number: 250256	Name: Barnstable County

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the Limit of Moderate Wave Action (LiMWA) information depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the National Flood Hazard Layer (NFHL).

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1 877 336 2627 (1 877 FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at http://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

SUMMARY OF REVISION

The purpose of this LOMR is to update the Limit of Moderate Wave Action (LiMWA) for Massachusetts. Please note no new coastal analysis was conducted, and only the LiMWA is revised by this LOMR. Other effective flood hazard information is not being revised, such as Special Flood Hazard Areas (SFHA), Base (1-percent-annual-chance) Flood Elevations, or floodway delineations. The Massachusetts Department of Conservation and Recreation (DCR) provided updated LiMWA delineations based on the latest FEMA guidance. Please note that there are no annotated Flood Insurance Rate Map (FIRM) or FIS attachments enclosed. However, the updated LiMWA information is available via FEMA's National Flood Hazard Layer (NFHL).

Through a recent partnership between Federal Emergency Management Agency (FEMA) and the Commonwealth of Massachusetts, the FIRMs in your community have been revised to show areas delineating the LiMWA, which separates the Coastal A Zone from the rest of the A Zone. State partners for this LOMR were the Flood Hazard Management Program Office in the Massachusetts Department of Conservation and Recreation and the Office of Coastal Zone Management.

We have determined that the revised LiMWA delineations are consistent with FEMA mapping policy and guidance and therefore meet the minimum floodplain management criteria of the National Flood Insurance Program (NFIP). With this LOMR, the National Flood Hazard Layer (NFHL) has been updated to show the revised LiMWA. The NFHL is a Federal Emergency Management Agency digital database that contains flood hazard mapping data for the NFIP. The NFHL is for community officials and residents looking to view effective flood hazard information in a map viewer or download for use in a Geographic Information Systems (GIS) application. More information on the NFHL is available at:
https://www.fema.gov/national-flood-hazard-layer-nfhl
Please note that the complete updated LiMWA is not shown on the downloadable version of the FIRMs available on the FEMA Flood Map Service Center.

The LiMWA is revised based on the coastal storm surge and wave modeling data from the most recent FEMA coastal Flood Insurance Study report for coastal communities. Communities or other affected users may request that FEMA revise the LiMWA based on better data and information that informs the identification and mapping of the LiMWA. The basis for the request to revise the LiMWA and whether or not other appealable flood hazard data is included in the request will dictate which FEMA process is most appropriate.

In accordance with 44 CFR Paragraph 60.3(b)(4) of the NFIP regulations (copy enclosed) and your local flood damage prevention ordinance, this revised LiMWA should be used for floodplain management purposes.

A copy of FEMA's fact sheet on the importance of the LiMWA is enclosed and also available at:
https://www.fema.gov/media-library/assets/documents/96413
If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Massachusetts DCR Flood Hazard Management Program office at (617) 626-1406.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1 877 336 2627 (1 877 FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at http://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

AFFECTED MAP PANELS

Barnstable County, Massachusetts (All Jurisdictions)

TYPE: FIRM	NO.: 25001C0103J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0104J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0108J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0109J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0111J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0112J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0116J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0117J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0128J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0136J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0137J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0138J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0139J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0141J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0143J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0144J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0227J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0229J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0231J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0232J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0233J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0237J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0239J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0241J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0242J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0244J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0251J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0253J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0261J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0262J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0263J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0264J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0294J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0313J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0316J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0317J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0319J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0338J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0339J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0343J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0389J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0393J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0394J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0407J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0409J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0413J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0414J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0416J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0417J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0418J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0419J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0426J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0427J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0428J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0429J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0436J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0437J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0438J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0439J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0441J	DATE: July 16, 2014

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Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

AFFECTED MAP PANELS (CONTINUED)

Barnstable County, Massachusetts (All Jurisdictions)

TYPE: FIRM	NO.: 25001C0443J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0482J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0484J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0491J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0492J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0494J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0501J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0503J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0511J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0513J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0526J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0527J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0531J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0532J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0534J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0543J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0544J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0551J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0552J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0553J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0554J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0556J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0557J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0558J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0559J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0563J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0564J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0567J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0568J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0569J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0576J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0577J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0578J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0579J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0581J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0582J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0587J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0588J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0589J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0591J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0592J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0593J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0594J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0611J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0612J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0613J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0616J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0617J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0626J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0627J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0628J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0629J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0631J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0633J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0636J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0637J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0639J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0707J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0709J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0716J	DATE: July 16, 2014

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Patrick "Rick" F. Sacbibit, P.E., Branch Chief
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Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

AFFECTED MAP PANELS (CONTINUED)

Barnstable County, Massachusetts (All Jurisdictions)

TYPE: FIRM	NO.: 25001C0717J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0718J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0719J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0729J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0733J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0734J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0736J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0737J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0741J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0742J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0751J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0752J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0753J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0754J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0756J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0757J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0761J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0776J	DATE: July 16, 2014
TYPE: FIRM	NO.: 25001C0782J	DATE: July 16, 2014

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Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS REVISION

Bristol County, Massachusetts

AFFECTED COMMUNITIES

CID Number: 250050	Name: Town of Berkley	CID Number: 255216	Name: City of New Bedford
CID Number: 250051	Name: Town of Dartmouth	CID Number: 255220	Name: Town of Somerset
CID Number: 250052	Name: Town of Dighton	CID Number: 255221	Name: Town of Swansea
CID Number: 250054	Name: Town of Fairhaven	CID Number: 255224	Name: Town of Westport
CID Number: 250055	Name: City of Fall River	CID Number: 250058	Name: Bristol County
CID Number: 250056	Name: Town of Freetown		

AFFECTED MAP PANELS

TYPE: FIRM	NO.: 25005C0242G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0463F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0244G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0464F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0261G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0466F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0263G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0468F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0326G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0469F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0327G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0477F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0328G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0479F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0329G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0481G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25005C0331G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0482G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25005C0332G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0483F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0333G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0484F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0334G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0486F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0337G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0487F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0341G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0488F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0394G	DATE: July 16, 2014	TYPE: FIRM	NO.: 25005C0489F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0413F	DATE: July 7, 2009	TYPE: FIRM	NO.: 25005C0491F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0425F	DATE: July 7, 2009	TYPE: FIRM	NO.: 25005C0501F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0442F	DATE: July 7, 2009	TYPE: FIRM	NO.: 25005C0502F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0454F	DATE: July 7, 2009	TYPE: FIRM	NO.: 25005C0503F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0458F	DATE: July 7, 2009	TYPE: FIRM	NO.: 25005C0504F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0461F	DATE: July 7, 2009	TYPE: FIRM	NO.: 25005C0526F	DATE: July 7, 2009
TYPE: FIRM	NO.: 25005C0462F	DATE: July 7, 2009	TYPE: FIRM	NO.: 25005C0531F	DATE: July 7, 2009

Middlesex County, Massachusetts

AFFECTED COMMUNITIES

CID Number: 250192	Name: City of Everett	CID Number: 255226	Name: Middlesex County

AFFECTED MAP PANEL

TYPE: FIRM	NO.: 25017C0443E	DATE: June 4, 2010

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Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS REVISION (CONTINUED)

Suffolk County, Massachusetts

AFFECTED COMMUNITIES

CID Number: 250286 Name: City of Boston	CID Number: 250289 Name: Town of Winthrop
CID Number: 250287 Name: City of Chelsea	CID Number: 250355 Name: Suffolk County
CID Number: 250288 Name: City of Revere	

AFFECTED MAP PANELS

TYPE: FIRM NO.: 25025C0009J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0083J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0017J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0084J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0018J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0091J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0028J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0092J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0029J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0101J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0036J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0102J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0037J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0103J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0038J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0104J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0039J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0108J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0081J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0111J DATE: March 16, 2016
TYPE: FIRM NO.: 25025C0082J DATE: March 16, 2016	TYPE: FIRM NO.: 25025C0112J DATE: March 16, 2016

Norfolk County, Massachusetts

AFFECTED COMMUNITIES

CID Number: 250233 Name: Town of Braintree	CID Number: 250257 Name: Town of Weymouth
CID Number: 250236 Name: Town of Cohasset	CID Number: 250353 Name: Norfolk County
CID Number: 255219 Name: City of Quincy	

AFFECTED MAP PANELS

TYPE: FIRM NO.: 25021C0066F DATE: June 9, 2014	TYPE: FIRM NO.: 25021C0093E DATE: July 17, 2012
TYPE: FIRM NO.: 25021C0067F DATE: June 9, 2014	TYPE: FIRM NO.: 25021C0114E DATE: July 17, 2012
TYPE: FIRM NO.: 25021C0069F DATE: June 9, 2014	TYPE: FIRM NO.: 25021C0226F DATE: June 9, 2014
TYPE: FIRM NO.: 25021C0086F DATE: June 9, 2014	TYPE: FIRM NO.: 25021C0227F DATE: June 9, 2014
TYPE: FIRM NO.: 25021C0088F DATE: June 9, 2014	TYPE: FIRM NO.: 25021C0231E DATE: July 17, 2012
TYPE: FIRM NO.: 25021C0089F DATE: June 9, 2014	TYPE: FIRM NO.: 25021C0256E DATE: July 17, 2012

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Federal Emergency Management Agency

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS REVISION (CONTINUED)

Dukes County, Massachusetts

AFFECTED COMMUNITIES

CID Number: 250070	Name: Town of Aquinnah
CID Number: 250068	Name: Town of Chilmark
CID Number: 250069	Name: Town of Edgartown
CID Number: 250071	Name: Town of Gosnold
CID Number: 250072	Name: Town of Oak Bluffs
CID Number: 250073	Name: Town of Tisbury
CID Number: 250074	Name: Town of West Tisbury
CID Number: 250181	Name: Dukes County
CID Number: 250007	Name: Wampanoag Tribe of Gay Head

AFFECTED MAP PANELS

TYPE: FIRM	NO.: 25007C0013J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0014J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0018J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0033J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0034J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0037J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0041J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0042J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0053J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0054J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0056J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0057J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0058J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0059J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0061J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0076J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0077J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0079J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0082J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0083J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0084J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0087J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0088J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0089J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0091J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0101J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0102J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0103J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0104J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0108J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0111J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0112J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0114J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0116J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0118J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0119J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0137J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0138J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0139J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0152J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0154J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0156J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0157J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0158J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0159J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0166J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0167J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0176J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0177J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0178J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0179J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0181J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0182J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0201J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0202J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0206J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0207J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0226J	DATE: July 20, 2016
TYPE: FIRM	NO.: 25007C0227J	DATE: July 20, 2016

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Federal Emergency Management Agency

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LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS REVISION (CONTINUED)

Essex County, Massachusetts

AFFECTED COMMUNITIES

CID Number: 250077	Name: City of Beverly
CID Number: 250080	Name: Town of Essex
CID Number: 250082	Name: City of Gloucester
CID Number: 250086	Name: Town of Ipswich
CID Number: 250088	Name: City of Lynn
CID Number: 250090	Name: Town of Manchester-by-the-Sea
CID Number: 250091	Name: Town of Marblehead
CID Number: 250095	Name: Town of Nahant
CID Number: 250096	Name: Town of Newbury
CID Number: 250097	Name: City of Newburyport
CID Number: 250100	Name: Town of Rockport
CID Number: 250101	Name: Town of Rowley
CID Number: 250102	Name: City of Salem
CID Number: 250103	Name: Town of Salisbury
CID Number: 250105	Name: Town of Swampscott
CID Number: 250013	Name: Essex County

AFFECTED MAP PANELS

TYPE: FIRM	NO.: 25009C0127F	DATE: July 3, 2012
TYPE: FIRM	NO.: 25009C0128F	DATE: July 3, 2012
TYPE: FIRM	NO.: 25009C0129F	DATE: July 3, 2012
TYPE: FIRM	NO.: 25009C0133F	DATE: July 3, 2012
TYPE: FIRM	NO.: 25009C0136G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0137G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0139G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0141G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0143G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0276G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0277G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0279G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0281G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0282G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0283G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0284G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0292G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0309G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0311G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0312G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0313G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0314G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0316G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0317G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0318G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0319G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0328G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0336G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0337G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0338G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0339G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0417G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0419G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0433G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0434G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0436G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0437G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0438G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0439G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0441G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0442G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0443G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0453G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0454G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0456G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0457G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0458G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0459G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0476G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0529G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0532G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0533G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0534G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0537G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0541G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0542G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0551G	DATE: July 16, 2014
TYPE: FIRM	NO.: 25009C0552G	DATE: July 16, 2014

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Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS REVISION (CONTINUED)

Nantucket County, Massachusetts

AFFECTED COMMUNITIES

CID Number: 250230 Name: Town of Nantucket	CID Number: 250352 Name: Nantucket County

AFFECTED MAP PANELS

TYPE: FIRM	NO.: 25019C0018G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0033G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0042G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0061G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0062G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0063G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0064G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0066G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0067G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0068G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0069G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0083G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0084G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0086G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0087G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0088G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0089G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0091G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0092G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0103G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0111G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0112G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0113G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0114G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0132G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0151G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0152G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0156G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0157G	DATE: June 9, 2014
TYPE: FIRM	NO.: 25019C0176G	DATE: June 9, 2014

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Patrick "Rick" F. Sacbibit, P.E., Branch Chief
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Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

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LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS REVISION (CONTINUED)

Plymouth County, Massachusetts

AFFECTED COMMUNITIES

CID Number: 250263	Name: Town of Duxbury	CID Number: 255214	Name: Town of Mattapoisett
CID Number: 250268	Name: Town of Hingham	CID Number: 250278	Name: Town of Plymouth
CID Number: 250269	Name: Town of Hull	CID Number: 250282	Name: Town of Scituate
CID Number: 250270	Name: Town of Kingston	CID Number: 255223	Name: Town of Wareham
CID Number: 255213	Name: Town of Marion	CID Number: 250354	Name: Plymouth County
CID Number: 250273	Name: Town of Marshfield		

AFFECTED MAP PANELS

TYPE: FIRM	NO.: 25023C0012J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0357K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0016J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0358K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0017J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0359K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0018J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0378K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0019J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0379K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0036J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0387K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0038J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0391K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0039J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0393K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0044K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0489K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0081J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0494J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0082J	DATE: July 17, 2012	TYPE: FIRM	NO.: 25023C0506K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0106K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0507K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0107K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0508K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0126K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0516K	DATE: November 4, 2016
TYPE: FIRM	NO.: 25023C0128K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0557K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0129K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0559K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0136K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0562J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0137K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0564K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0138K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0566J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0139K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0567K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0143K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0568K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0227K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0569J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0231K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0576K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0232K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0577J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0233K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0578K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0234K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0579K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0239K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0581K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0241K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0582K	DATE: February 5, 2014
TYPE: FIRM	NO.: 25023C0242K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0583J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0243K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0584J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0244K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0586J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0263K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0587J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0352K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0601J	DATE: July 17, 2012
TYPE: FIRM	NO.: 25023C0356K	DATE: November 4, 2016	TYPE: FIRM	NO.: 25023C0627J	DATE: July 17, 2012

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1 877 336 2627 (1 877 FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at http://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93 234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90 448), 42 U.S.C. 4001 4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance stillwater elevations computed in the FIS for your community. A comprehensive restudy of your community's flood hazards could establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1 877 336 2627 (1 877 FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at http://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Dean Savramis
Director, Mitigation Division
Federal Emergency Management Agency, Region I
99 High Street, Sixth Floor
Boston, MA 02110
(617) 832 4761

STATUS OF COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panels warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time. This document revises the effective NFIP map, as indicated in the National Flood Hazard Layer (NFHL).

PUBLIC NOTIFICATION OF REVISION

This LOMR revises the LiMWA information for your community. No flood hazards are being revised. Therefore, this LOMR is effective as of the date of this letter.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1 877 336 2627 (1 877 FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on our website at http://www.fema.gov/national-flood-insurance-program.

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Washington, D.C. 20472

Attachment to LOMR 16-01-2154P

With this Letter of Map Revision (LOMR), we are revising the Limit of Moderate Wave Action (LiMWA) information shown on the Flood Insurance Rate Map (FIRM) Panels listed on Pages 3 through 5 of this LOMR's Determination Document. The revised information will not be shown on the downloadable version of the FIRM panels available on the FEMA Flood Map Service Center, but may be viewed on FEMA's National Flood Hazard Layer (NFHL). The NFHL is a Federal Emergency Management Agency digital database that contains flood hazard mapping data for the National Flood Insurance Program (NFIP). The NFHL is for community officials and residents looking to view effective flood hazard information in a map viewer or download for use in a Geographic Information System (GIS) application. More information on the NFHL is available at: https://www.fema.gov/national-flood-hazard-layer-nfhl.

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REFLECT LOMR
EFFECTIVE: SEPTEMBER 8, 2017

or knowledge of conditions that require, particularly for human safety, higher standards than the minimum criteria set forth in subpart A of this part. Therefore, any flood plain management regulations adopted by a State or a community which are more restrictive than the criteria set forth in this part are encouraged and shall take precedence.

[41 FR 46975, Oct. 26, 1976. Redesignated at 44 FR 31177, May 31, 1979, as amended at 48 FR 44552, Sept. 29, 1983; 49 FR 4751, Feb. 8, 1984]

§ 60.2 Minimum compliance with flood plain management criteria.

(a) A flood-prone community applying for flood insurance eligibility shall meet the standards of § 60.3(a) in order to become eligible if a FHBM has not been issued for the community at the time of application. Thereafter, the community will be given a period of six months from the date the Federal Insurance Administrator provides the data set forth in § 60.3 (b), (c), (d), (e) or (f), in which to meet the requirements of the applicable paragraph. If a community has received a FHBM, but has not yet applied for Program eligibility, the community shall apply for eligibility directly under the standards set forth in § 60.3(b). Thereafter, the community will be given a period of six months from the date the Federal Insurance Administrator provides the data set forth in § 60.3 (c), (d), (e) or (f) in which to meet the requirements of the applicable paragraph.

(b) A mudslide (i.e., mudflow)-prone community applying for flood insurance eligibility shall meet the standards of § 60.4(a) to become eligible. Thereafter, the community will be given a period of six months from the date the mudslide (i.e., mudflow) areas having special mudslide hazards are delineated in which to meet the requirements of § 60.4(b).

(c) A flood-related erosion-prone community applying for flood insurance eligibility shall meet the standards of § 60.5(a) to become eligible. Thereafter, the community will be given a period of six months from the date the flood-related erosion areas having special erosion hazards are delineated in which to meet the requirements of § 60.5(b).

(d) Communities identified in part 65 of this subchapter as containing more than one type of hazard (e.g., any combination of special flood, mudslide (i.e., mudflow), and flood-related erosion hazard areas) shall adopt flood plain management regulations for each type of hazard consistent with the requirements of §§ 60.3, 60.4 and 60.5.

(e) Local flood plain management regulations may be submitted to the State Coordinating Agency designated pursuant to § 60.25 for its advice and concurrence. The submission to the State shall clearly describe proposed enforcement procedures.

(f) The community official responsible for submitting annual or biennial reports to the Federal Insurance Administrator pursuant to § 59.22(b)(2) of this subchapter shall also submit copies of each annual or biennial report to any State Coordinating Agency.

(g) A community shall assure that its comprehensive plan is consistent with the flood plain management objectives of this part.

(h) The community shall adopt and enforce flood plain management regulations based on data provided by the Federal Insurance Administrator. Without prior approval of the Federal Insurance Administrator, the community shall not adopt and enforce flood plain management regulations based upon modified data reflecting natural or man-made physical changes.

[41 FR 46975, Oct. 26, 1976. Redesignated at 44 FR 31177, May 31, 1979, as amended at 48 FR 29318, June 24, 1983; 48 FR 44552, Sept. 29, 1983; 49 FR 4751, Feb. 8, 1984; 50 FR 36024, Sept. 4, 1985; 59 FR 53598, Oct. 25, 1994; 62 FR 55716, Oct. 27, 1997]

§ 60.3 Flood plain management criteria for flood-prone areas.

The Federal Insurance Administrator will provide the data upon which flood plain management regulations shall be based. If the Federal Insurance Administrator has not provided sufficient data to furnish a basis for these regulations in a particular community, the community shall obtain, review and reasonably utilize data available from other Federal, State or other sources pending receipt of data from the Federal Insurance Administrator. However, when special flood hazard area

designations and water surface elevations have been furnished by the Federal Insurance Administrator, they shall apply. The symbols defining such special flood hazard designations are set forth in § 64.3 of this subchapter. In all cases the minimum requirements governing the adequacy of the flood plain management regulations for flood-prone areas adopted by a particular community depend on the amount of technical data formally provided to the community by the Federal Insurance Administrator. Minimum standards for communities are as follows:

(a) When the Federal Insurance Administrator has not defined the special flood hazard areas within a community, has not provided water surface elevation data, and has not provided sufficient data to identify the floodway or coastal high hazard area, but the community has indicated the presence of such hazards by submitting an application to participate in the Program, the community shall:

(1) Require permits for all proposed construction or other development in the community, including the placement of manufactured homes, so that it may determine whether such construction or other development is proposed within flood-prone areas;

(2) Review proposed development to assure that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334;

(3) Review all permit applications to determine whether proposed building sites will be reasonably safe from flooding. If a proposed building site is in a flood-prone area, all new construction and substantial improvements shall (i) be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, (ii) be constructed with materials resistant to flood damage, (iii) be constructed by methods and practices that minimize flood damages, and (iv) be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

(4) Review subdivision proposals and other proposed new development, including manufactured home parks or subdivisions, to determine whether such proposals will be reasonably safe from flooding. If a subdivision proposal or other proposed new development is in a flood-prone area, any such proposals shall be reviewed to assure that (i) all such proposals are consistent with the need to minimize flood damage within the flood-prone area, (ii) all public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize or eliminate flood damage, and (iii) adequate drainage is provided to reduce exposure to flood hazards;

(5) Require within flood-prone areas new and replacement water supply systems to be designed to minimize or eliminate infiltration of flood waters into the systems; and

(6) Require within flood-prone areas (i) new and replacement sanitary sewage systems to be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters and (ii) onsite waste disposal systems to be located to avoid impairment to them or contamination from them during flooding.

(b) When the Federal Insurance Administrator has designated areas of special flood hazards (A zones) by the publication of a community's FHBM or FIRM, but has neither produced water surface elevation data nor identified a floodway or coastal high hazard area, the community shall:

(1) Require permits for all proposed construction and other developments including the placement of manufactured homes, within Zone A on the community's FHBM or FIRM;

(2) Require the application of the standards in paragraphs (a) (2), (3), (4), (5) and (6) of this section to development within Zone A on the community's FHBM or FIRM;

(3) Require that all new subdivision proposals and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than 50 lots or 5 acres, whichever is the lesser, include within such proposals base flood elevation data;

(4) Obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State, or other source, including data developed pursuant to paragraph (b)(3) of this section, as criteria for requiring that new construction, substantial improvements, or other development in Zone A on the community's FHBM or FIRM meet the standards in paragraphs (c)(2), (c)(3), (c)(5), (c)(6), (c)(12), (c)(14), (d)(2) and (d)(3) of this section;

(5) Where base flood elevation data are utilized, within Zone A on the community's FHBM or FIRM:

(i) Obtain the elevation (in relation to mean sea level) of the lowest floor (including basement) of all new and substantially improved structures, and

(ii) Obtain, if the structure has been floodproofed in accordance with paragraph (c)(3)(ii) of this section, the elevation (in relation to mean sea level) to which the structure was floodproofed, and

(iii) Maintain a record of all such information with the official designated by the community under § 59.22 (a)(9)(iii);

(6) Notify, in riverine situations, adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse, and submit copies of such notifications to the Federal Insurance Administrator;

(7) Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained;

(8) Require that all manufactured homes to be placed within Zone A on a community's FHBM or FIRM shall be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State and local anchoring requirements for resisting wind forces.

(c) When the Federal Insurance Administrator has provided a notice of final flood elevations for one or more special flood hazard areas on the community's FIRM and, if appropriate, has designated other special flood hazard areas without base flood elevations on the community's FIRM, but has not identified a regulatory floodway or coastal high hazard area, the community shall:

(1) Require the standards of paragraph (b) of this section within all A1–30 zones, AE zones, A zones, AH zones, and AO zones, on the community's FIRM;

(2) Require that all new construction and substantial improvements of residential structures within Zones A1–30, AE and AH zones on the community's FIRM have the lowest floor (including basement) elevated to or above the base flood level, unless the community is granted an exception by the Federal Insurance Administrator for the allowance of basements in accordance with § 60.6 (b) or (c);

(3) Require that all new construction and substantial improvements of nonresidential structures within Zones A1–30, AE and AH zones on the community's firm (i) have the lowest floor (including basement) elevated to or above the base flood level or, (ii) together with attendant utility and sanitary facilities, be designed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy;

(4) Provide that where a non-residential structure is intended to be made watertight below the base flood level, (i) a registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction, and shall certify that the design and methods of

construction are in accordance with accepted standards of practice for meeting the applicable provisions of paragraph (c)(3)(ii) or (c)(8)(ii) of this section, and (ii) a record of such certificates which includes the specific elevation (in relation to mean sea level) to which such structures are floodproofed shall be maintained with the official designated by the community under § 59.22(a)(9)(iii);

(5) Require, for all new construction and substantial improvements, that fully enclosed areas below the lowest floor that are usable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria: A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

(6) Require that manufactured homes that are placed or substantially improved within Zones A1–30, AH, and AE on the community's FIRM on sites

(i) Outside of a manufactured home park or subdivision,

(ii) In a new manufactured home park or subdivision,

(iii) In an expansion to an existing manufactured home park or subdivision, or

(iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to or above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist floatation collapse and lateral movement.

(7) Require within any AO zone on the community's FIRM that all new construction and substantial improvements of residential structures have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified);

(8) Require within any AO zone on the community's FIRM that all new construction and substantial improvements of nonresidential structures (i) have the lowest floor (including basement) elevated above the highest adjacent grade at least as high as the depth number specified in feet on the community's FIRM (at least two feet if no depth number is specified), or (ii) together with attendant utility and sanitary facilities be completely floodproofed to that level to meet the floodproofing standard specified in § 60.3(c)(3)(ii);

(9) Require within any A99 zones on a community's FIRM the standards of paragraphs (a)(1) through (a)(4)(i) and (b)(5) through (b)(9) of this section;

(10) Require until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1–30 and AE on the community's FIRM, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

(11) Require within Zones AH and AO, adequate drainage paths around structures on slopes, to guide floodwaters around and away from proposed structures.

(12) Require that manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A–1–30, AH, and AE on the community's FIRM that are not subject to the provisions of paragraph (c)(6) of this section be elevated so that either

(i) The lowest floor of the manufactured home is at or above the base flood elevation, or

(ii) The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches in height above grade and be securely anchored to an adequately anchored foundation system to resist floatation, collapse, and lateral movement.

(13) Notwithstanding any other provisions of §60.3, a community may approve certain development in Zones A1–30, AE, and AH, on the community's FIRM which increase the water surface elevation of the base flood by more than one foot, provided that the community first applies for a conditional FIRM revision, fulfills the requirements for such a revision as established under the provisions of §65.12, and receives the approval of the Federal Insurance Administrator.

(14) Require that recreational vehicles placed on sites within Zones A1–30, AH, and AE on the community's FIRM either

(i) Be on the site for fewer than 180 consecutive days,

(ii) Be fully licensed and ready for highway use, or

(iii) Meet the permit requirements of paragraph (b)(1) of this section and the elevation and anchoring requirements for "manufactured homes" in paragraph (c)(6) of this section.

A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.

(d) When the Federal Insurance Administrator has provided a notice of final base flood elevations within Zones A1–30 and/or AE on the community's FIRM and, if appropriate, has designated AO zones, AH zones, A99 zones, and A zones on the community's FIRM, and has provided data from which the community shall designate its regulatory floodway, the community shall:

(1) Meet the requirements of paragraphs (c) (1) through (14) of this section;

(2) Select and adopt a regulatory floodway based on the principle that the area chosen for the regulatory floodway must be designed to carry the waters of the base flood, without increasing the water surface elevation of that flood more than one foot at any point;

(3) Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge;

(4) Notwithstanding any other provisions of §60.3, a community may permit encroachments within the adopted regulatory floodway that would result in an increase in base flood elevations, provided that the community first applies for a conditional FIRM and floodway revision, fulfills the requirements for such revisions as established under the provisions of §65.12, and receives the approval of the Federal Insurance Administrator.

(e) When the Federal Insurance Administrator has provided a notice of final base flood elevations within Zones A1–30 and/or AE on the community's FIRM and, if appropriate, has designated AH zones, AO zones, A99 zones, and A zones on the community's FIRM, and has identified on the community's FIRM coastal high hazard areas by designating Zones V1–30, VE, and/or V, the community shall:

(1) Meet the requirements of paragraphs (c)(1) through (14) of this section;

(2) Within Zones V1–30, VE, and V on a community's FIRM, (i) obtain the elevation (in relation to mean sea level) of the bottom of the lowest structural member of the lowest floor (excluding pilings and columns) of all new and substantially improved structures, and whether or not such structures contain a basement, and (ii) maintain a record of all such information with the official designated by the community under §59.22(a)(9)(iii);

(3) Provide that all new construction within Zones V1–30, VE, and V on the community's FIRM is located landward of the reach of mean high tide;

(4) Provide that all new construction and substantial improvements in Zones V1–30 and VE, and also Zone V if base flood elevation data is available, on the community's FIRM, are elevated on pilings and columns so that (i) the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to or above the base flood level; and (ii) the pile or column foundation and structure attached thereto is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components. Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards. A registered professional engineer or architect shall develop or review the structural design, specifications and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice for meeting the provisions of paragraphs (e)(4) (i) and (ii) of this section.

(5) Provide that all new construction and substantial improvements within Zones V1–30, VE, and V on the community's FIRM have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood latticework, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. For the purposes of this section, a breakway wall shall have a design safe loading resistance of not less than 10 and no more than 20 pounds per square foot. Use of breakway walls which exceed a design safe loading resistance of 20 pounds per square foot (either by design or when so required by local or State codes) may be permitted only if a registered professional engineer or architect certifies that the designs proposed meet the following conditions:

(i) Breakaway wall collapse shall result from a water load less than that which would occur during the base flood; and,

(ii) The elevated portion of the building and supporting foundation system shall not be subject to collapse, displacement, or other structural damage due to the effects of wind and water loads acting simultaneously on all building components (structural and non-structural). Water loading values used shall be those associated with the base flood. Wind loading values used shall be those required by applicable State or local building standards.

Such enclosed space shall be useable solely for parking of vehicles, building access, or storage.

(6) Prohibit the use of fill for structural support of buildings within Zones V1–30, VE, and V on the community's FIRM;

(7) Prohibit man-made alteration of sand dunes and mangrove stands within Zones V1–30, VE, and V on the community's FIRM which would increase potential flood damage.

(8) Require that manufactured homes placed or substantially improved within Zones V1–30, V, and VE on the community's FIRM on sites

(i) Outside of a manufactured home park or subdivision,

(ii) In a new manufactured home park or subdivision,

(iii) In an expansion to an existing manufactured home park or subdivision, or

(iv) In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood, meet the standards of paragraphs (e)(2) through (7) of this section and that manufactured homes placed or substantially improved on other sites in an existing manufactured home park or subdivision within Zones VI–30, V, and VE on the community's FIRM meet the requirements of paragraph (c)(12) of this section.

(9) Require that recreational vehicles placed on sites within Zones V1–30, V, and VE on the community's FIRM either

(i) Be on the site for fewer than 180 consecutive days,

(ii) Be fully licensed and ready for highway use, or

(iii) Meet the requirements in paragraphs (b)(1) and (e) (2) through (7) of this section.

A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions.

(f) When the Federal Insurance Administrator has provided a notice of final base flood elevations within Zones A1–30 or AE on the community's FIRM, and, if appropriate, has designated AH zones, AO zones, A99 zones, and A zones on the community's FIRM, and has identified flood protection restoration areas by designating Zones AR, AR/A1–30, AR/AE, AR/AH, AR/AO, or AR/A, the community shall:

(1) Meet the requirements of paragraphs (c)(1) through (14) and (d)(1) through (4) of this section.

(2) Adopt the official map or legal description of those areas within Zones AR, AR/A1–30, AR/AE, AR/AH, AR/A, or AR/AO that are designated developed areas as defined in § 59.1 in accordance with the eligibility procedures under § 65.14.

(3) For all new construction of structures in areas within Zone AR that are designated as developed areas and in other areas within Zone AR where the AR flood depth is 5 feet or less:

(i) Determine the lower of either the AR base flood elevation or the elevation that is 3 feet above highest adjacent grade; and

(ii) Using this elevation, require the standards of paragraphs (c)(1) through (14) of this section.

(4) For all new construction of structures in those areas within Zone AR that are not designated as developed areas where the AR flood depth is greater than 5 feet:

(i) Determine the AR base flood elevation; and

(ii) Using that elevation require the standards of paragraphs (c)(1) through (14) of this section.

(5) For all new construction of structures in areas within Zone AR/A1–30, AR/AE, AR/AH, AR/AO, and AR/A:

(i) Determine the applicable elevation for Zone AR from paragraphs (a)(3) and (4) of this section;

(ii) Determine the base flood elevation or flood depth for the underlying A1–30, AE, AH, AO and A Zone; and

(iii) Using the higher elevation from paragraphs (a)(5)(i) and (ii) of this section require the standards of paragraphs (c)(1) through (14) of this section.

(6) For all substantial improvements to existing construction within Zones AR/A1–30, AR/AE, AR/AH, AR/AO, and AR/A:

(i) Determine the A1–30 or AE, AH, AO, or A Zone base flood elevation; and

(ii) Using this elevation apply the requirements of paragraphs (c)(1) through (14) of this section.

(7) Notify the permit applicant that the area has been designated as an AR, AR/A1–30, AR/AE, AR/AH, AR/AO, or AR/A Zone and whether the structure will be elevated or protected to or above the AR base flood elevation.

[41 FR 46975, Oct. 26, 1976]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 60.3, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at *www.fdsys.gov*.

§ 60.4 Flood plain management criteria for mudslide (i.e., mudflow)-prone areas.

The Federal Insurance Administrator will provide the data upon which flood plain management regulations shall be based. If the Federal Insurance Administrator has not provided sufficient data to furnish a basis for these regulations in a particular community, the community shall obtain, review, and reasonably utilize data available from other Federal, State or other sources pending receipt of data from the Federal Insurance Administrator. However, when special mudslide (i.e., mudflow) hazard area designations have been furnished by the Federal Insurance Administrator, they shall apply. The symbols defining such special mudslide (i.e., mudflow) hazard designations are set forth in § 64.3 of this subchapter. In all cases, the minimum requirements for mudslide (i.e., mudflow)-prone areas adopted by a particular community depend on the amount of technical data provided to the community by the Federal Insurance Administrator. Minimum standards for communities are as follows:

(a) When the Federal Insurance Administrator has not yet identified any

FEMA

Fact Sheet

Federal Insurance and Mitigation Administration

Importance of the Limit of Moderate Wave Action (LiMWA)

The coastal population in the United States has increased significantly over the last few decades. With this growth in population, increased coastal development has occurred, putting more buildings at risk from flooding and other coastal action. Low-lying coastal areas are especially vulnerable to damage from erosion, waves, and storm surge. The National Flood Insurance Program (NFIP) depicts two coastal flood hazard zones on its Flood Insurance Rate Maps (FIRMs):

- Zone VE, where the flood elevation includes wave heights *equal to or greater than* 3 feet; and
- Zone AE, where the flood elevation includes wave heights *less than* 3 feet.

Post-storm field visits and laboratory tests throughout coastal flood hazard areas have consistently confirmed that wave heights as low as 1.5 feet can cause significant damage to structures that are constructed without considering coastal hazards. FIRMs recently published also include a line showing the Limit of Moderate Wave Action, or LiMWA, which is the inland limit of the area expected to receive 1.5-foot or greater breaking waves during the 1-percent-annual-chance flood event (see Figure 1).

Understanding LiMWA

The addition of the LiMWA area to FIRMs allows communities and individuals to better understand the flood risks to their property. The LiMWA area alerts property owners on the seaward side of the line that although their property is in Zone AE, their property may be affected by 1.5-foot or higher breaking waves and may therefore be at significant risk during a 1-percent-annual-chance flood event. While not formally defined in the NFIP regulations or mapped as a flood zone, the area between Zone VE and the LiMWA is called the Coastal A Zone (see Figure 2). This area is subject to flood hazards associated with floating debris and high-velocity flow associated with waves and debris that can erode and scour building foundations and, in extreme cases, cause foundation failure.

LiMWA QUICK FACTS

- Waves of 1.5 feet or higher have been shown to cause significant damage to structures
- A LiMWA line is shown on some FIRMs for areas along coastlines
- Structural fill should not be used in the Coastal A Zone
- International Codes® require Zone VE construction standards in identified Coastal A Zone areas
- Structures in the Coastal A Zone should be built with piling or column foundations
- Enclosure under elevated structures should be limited to 299 square feet or less within the Coastal A Zone
- Elevation of the lowest horizontal structural member of the lowest floor should be at or above the base flood elevation (BFE) (see http://www.fema.gov/media-library/assets/documents/3490?id=1718 for more information)
- NFIP free-of-obstruction requirements should apply in the Coastal A Zone
- Communities that adopt Zone VE standards in the Coastal A Zone and reference the LiMWA area receive Community Rating System (CRS) credits, which could lower flood insurance premiums for residents and business owners

For additional background information on LiMWA, please refer to FEMA Procedure Memorandum 50, available at: http://www.fema.gov/media-library-data/1388777384290.pdf

Effects on Property Owners

Residents and business owners living or working in the Coastal A Zone should be aware of the potential wave action and the accompanying damage that could occur. Property owners are encouraged to build safer and higher to minimize the risk to life and property.

While the risk of damage is higher on the seaward side of the LiMWA than in other parts of Zone AE, NFIP premiums currently do not account for a building's location relative to the LiMWA. The Federal mandatory purchase requirement to carry flood insurance as a condition of obtaining a mortgage applies in mapped special flood hazard areas. Property owners are encouraged to carry coverage equivalent to the replacement cost of their building and include contents coverage.

After an Event

After a significant event, FEMA may issue revised flood maps. If remapping results in a higher-risk flood zone or a higher base flood elevation (BFE), the property owner should contact his or her insurance agent to discuss possible cost-saving options (e.g., elevating). To learn more about flood insurance and the risks of flooding, and to locate an agent, visit https://www.floodsmart.gov/floodsmart/.

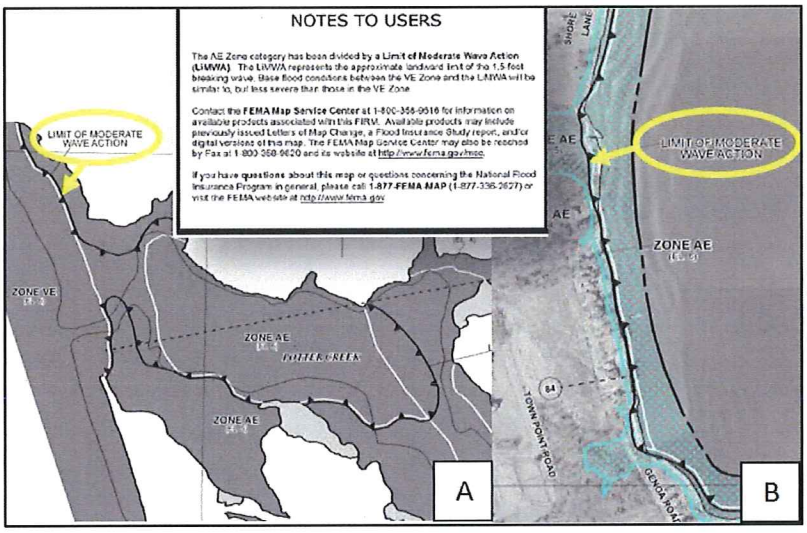


Figure 1: FIRM showing area seaward of the LiMWA

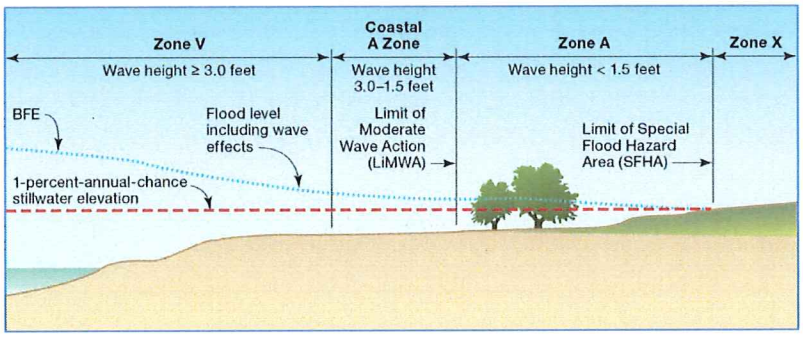


Figure 2: Schematic of coastal flood zones

FOR MORE INFORMATION

FEMA's Floodplain Management Branch
Defines floodplain management and its role in the NFIP: http://www.fema.gov/fpm

Homebuilder's Guide to Coastal Construction
A series of fact sheets providing information about responsible building practices, including freeboard: http://www.fema.gov/library/viewRecord.do?id=2138

FloodSmart
Information for consumers about flood insurance and the NFIP: https://www.floodsmart.gov/

LICENSING

TOWN OF EASTHAM
2500 State Highway, Eastham, MA 02642 - 2544
All departments 508 240-5900 *Fax* 508 240-1291
www.eastham-ma.gov

Date: November 6, 2017

To: Board of Selectmen

From: Jacqueline W. Beebe, Town Administrator

Re: Transient Vendor Permits

Turnip Festival – Saturday, November 18th, 2017.

Please find below the Transient Vendor applicants for approval by the Board of Selectmen. In each case, the $20.00 fee has been received. The following permits valid as stated below.

***** Permits prepared in bulk for the Turnip Festival on Saturday, November 18th.**

*** Bailey, Heather Valid: November 18, 2017- November 18, 2018	*** Bakas, Mary Valid: November 18, 2017- November 18, 2018
*** Baudanza, Jennifer Valid: November 18, 2017- November 18, 2018	*** Blanco Ramon, Adela Valid: November 18, 2017- November 18, 2018
*** Burke, Heather Valid: November 18, 2017- November 18, 2018	*** Burns, Maura Valid: November 18, 2017- November 18, 2018
*** Burton, Carol Valid: November 18, 2017- November 18, 2018	*** Calderwood, Rubyanne Valid: November 18, 2017- November 18, 2018
*** Cole, Desiree Valid: November 18, 2017- November 18, 2018	*** Cottle, Jeanmarie Valid: November 18, 2017- November 18, 2018
*** Ditzel, Jane Valid: November 18, 2017- November 18, 2018	*** Dugas, Megan Valid: November 18, 2017- November 18, 2018
*** Fein, Corey Valid: November 18, 2017- November 18, 2018	*** Foster, Stephanie Valid: November 18, 2017- November 18, 2018 (Pd #385 09/01/17)
*** Goldman, Laurie Valid: November 18, 2017- November 18, 2018	*** Hanrihan, Carole Valid: November 18, 2017- November 18, 2018

*** Harnett, Michael Valid: November 18, 2017- November 18, 2018	*** Hemeon, Brent & Peggy Valid: November 18, 2017- November 18, 2018
*** Hill, Heather A. Valid: November 18, 2017- November 18, 2018	*** Jackson, Katherine Valid: November 18, 2017- November 18, 2018
*** LeConey, Cindy Valid: November 18, 2017- November 18, 2018	*** McQueeney, Robby Valid: November 18, 2017- November 18, 2018
*** Martin, Amy Valid: November 18, 2017- November 18, 2018	*** Moisan, Elizabeth Valid: November 18, 2017- November 18, 2018
*** Moses, Milisa Valid: November 18, 2017- November 18, 2018	*** Noone, Traci Valid: November 18, 2017- November 18, 2018
*** Osmun, Ed & Betty Valid: November 18, 2017- November 18, 2018	*** Preston, Gale Valid: November 18, 2017- November 18, 2018
*** Reid, Matt Valid: November 18, 2017- November 18, 2018	*** Rich, Julie Valid: November 18, 2017- November 18, 2018
*** Shkapich, Kim Valid: November 18, 2017- November 18, 2018	*** Silver, Susan Valid: November 18, 2017- November 18, 2018
*** Sprague, Diane Valid: November 18, 2017- November 18, 2018	*** Staaterman, Peter & Dills Valid: November 18, 2017- November 18, 2018
*** Stockdale, Sherri Valid: November 18, 2017- November 18, 2018	*** Tomchak, Pamela Valid: November 18, 2017- November 18, 2018
*** Travisano, Eliza Valid: November 18, 2017- November 18, 2018	*** Tupper, Ralph Valid: November 18, 2017- November 18, 2018
*** Waldron, Elise Valid: November 18, 2017- November 18, 2018	*** Wells, Connie Valid: November 18, 2017- November 18, 2018
*** Wignot, Robin Valid: November 18, 2017- November 18, 2018	*** Anslow Staszewski, Roberta Valid: November 18, 2017- November 18, 2018

ADMINISTRATIVE MATTERS

(2)

Eastham Selectmen
Eastham Town Offices
2500 State Highway
Eastham, MA 02642

ADMINISTRATION
OCT 13 2017
RECEIVED

Cheryl & Jim Blair
98A Oak Street
Norton, MA 02766

Dear Selectmen;

Our family has been part-time residents of 5 Winterberry Lane, Eastham for over 50 years (even before the street was named). My family (John Bologna) purchased the property and built a home on it, we have been living on it for four generations. My husband and I now own the property and have been spending a lot of time with our family here in Eastham for the last 18 years, since my mother passed.

We are planning to live on Cape now that we are both retired, but our home needs serious renovating. My father and mother, with our family, built the Cape house as a retirement home for my parents. Our family has grown over the last 50 years, the home needs to be made larger to accommodate our bigger family and to update its outdated structure.

We are planning to begin the renovation in the spring. While the workmen are on site, both my husband and I would like to be on-site making sure that the design and building of the renovations are what we are expecting.

All this said, we would like to ask permission of the Eastham selectmen to have a temporary travel trailer placed on the property while the house is being renovated. We realize that we will need to secure a permit to live in the trailer while the renovations are ongoing. This will not be a permanent addition, but will remain on the property only until we are able to acquire an occupancy permit.

We are enclosing a copy of the plot plan of our property and the proposed location of the travel trailer while work is being done on our home.

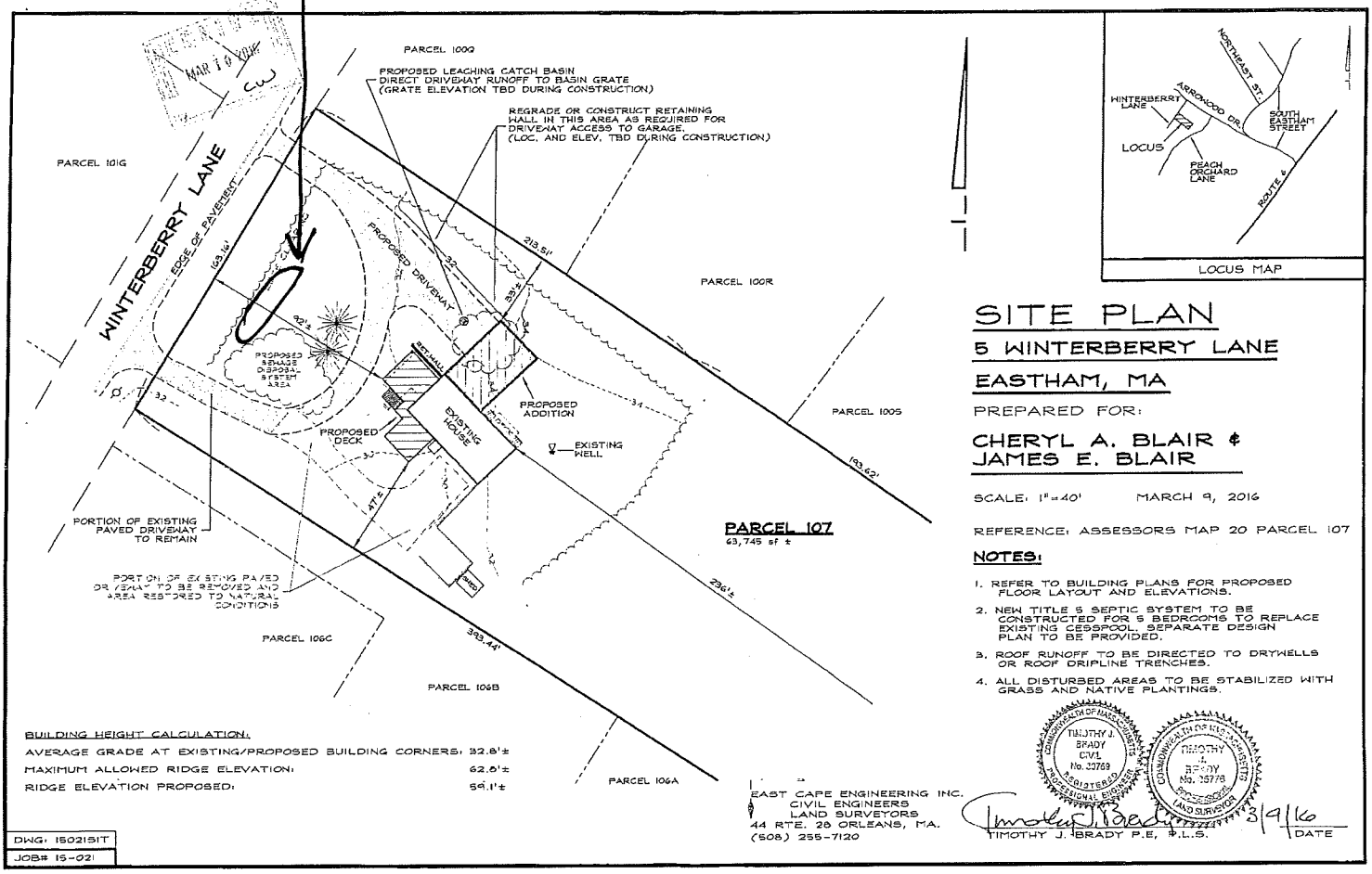
It is our intention, given we have permission from the selectmen to place the trailer on our property, that we will apply for the permit from Eastham's building inspector to temporarily hook-up the trailer to our utilities.

Thank you,

Cheryl

Cheryl Blair

Proposed location of travel trailer



LOCUS MAP

SITE PLAN

5 WINTERBERRY LANE

EASTHAM, MA

PREPARED FOR:

CHERYL A. BLAIR &
JAMES E. BLAIR

SCALE: 1"=40' MARCH 9, 2016

REFERENCE: ASSESSORS MAP 20 PARCEL 107

NOTES:

1. REFER TO BUILDING PLANS FOR PROPOSED FLOOR LAYOUT AND ELEVATIONS.
2. NEW TITLE 5 SEPTIC SYSTEM TO BE CONSTRUCTED FOR 5 BEDROOMS TO REPLACE EXISTING CESSPOOL. SEPARATE DESIGN PLAN TO BE PROVIDED.
3. ROOF RUNOFF TO BE DIRECTED TO DRYWELLS OR ROOF DRIPLINE TRENCHES.
4. ALL DISTURBED AREAS TO BE STABILIZED WITH GRASS AND NATIVE PLANTINGS.

BUILDING HEIGHT CALCULATION:

AVERAGE GRADE AT EXISTING/PROPOSED BUILDING CORNERS:	32.8'±
MAXIMUM ALLOWED RIDGE ELEVATION:	62.8'±
RIDGE ELEVATION PROPOSED:	56.1'±

TIMOTHY J. BRADY CIVIL No. 35769 REGISTERED PROFESSIONAL ENGINEER
COMMONWEALTH OF MASSACHUSETTS
TIMOTHY J. BRADY No. 35778 REGISTERED LAND SURVEYOR
COMMONWEALTH OF MASSACHUSETTS

Timothy J. Brady 3/9/16
TIMOTHY J. BRADY P.E., P.L.S. DATE

EAST CAPE ENGINEERING INC.
CIVIL ENGINEERS
LAND SURVEYORS
44 RTE. 28 ORLEANS, MA.
(508) 255-7120

DWG: 15021SIT
JOB# 15-021

TOWN OF EASTHAM

2500 State Highway, Eastham, MA 02642
All Departments 508-240-5900
www.eastham-ma.gov

August 1, 2014

Memo To: Tom Wingard

Memo From: Laurie Gillespie-Lee

Re: Permits for Campers or Trailers Stored on Resident Properties

To proceed to apply for a permit to store Campers or Trailers on Resident Properties, a letter should be sent to the Town of Eastham's Board of Selectmen.

The letter should state the following information:

- the request for a permit to store the camper or trailer on their property
- what the camper is used for
- resident name, mailing address and phone number
- the property address and the name of the owner of the property

Once the letter is received, the request will be placed on the next open agenda for the Board of Selectmen. The resident will be advised of the date and time of the meeting in the event they want to attend.

After the meeting, a letter will be sent to the property owner to confirm the decision of the Board of Selectmen.

Info (3)

ADMINISTRATION
OCT 31 2017
RECEIVED

D'ELIA & CAVANAUGH
ATTORNEYS AT LAW

JOSEPH H. D'ELIA
GEORGE B. CAVANAUGH

161 CRANBERRY HIGHWAY
P.O. BOX 707
ORLEANS, MA 02653
508-255-2255 (phone)
508-255-2563 (fax)
DELIACAVN@AOL.COM

October 31, 2017

Town of Eastham
Board of Selectmen
2500 State Highway
Eastham, MA 02642

RE: Property: 405 Higgins Road, Eastham, MA 02642
Assessor's Map #04 Parcel/Lot # 457
Owner(s): Everett A. Kosarick, Trustee of the Kosarick Eastham Realty Trust
Owner's Phone No.: (702)488-4294
Our File No: 25525

Dear members of the Board:

Please accept this letter as notice of the owner's intention to sell the above captioned property. Under G.L. Chapter 61B Section 9 the Town of Eastham has the option of first refusal. Enclosed herewith please find a copy of the fully executed Purchase and Sale Agreement along with a copy of the Property Summary Report. It is the intention of the Buyer to use the property as a residential dwelling.

Thank you for your attention to this matter. Please do not hesitate to contact me if you have any questions.

Sincerely,

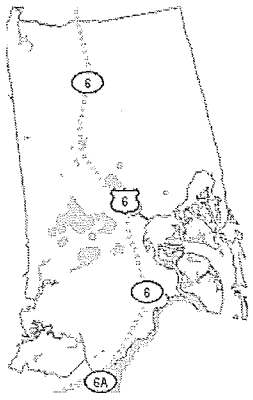
Angie M. Jennings

Angie M. Jennings for
D'Elia & Cavanaugh

TOWN OF EASTHAM - PROPERTY SUMMARY REPORT

PARCEL ID:	04-457	KEY:	734	LOCATION:	405 HIGGINS RD

CURRENT OWNER	FY' 2017 PARCEL VALUE	
KOSARICK EASTHAM REALTY TRUST, EVERETT A KOSARICK TTEE	LAND VAL:	$1,921,320.00
34 SHUMWAY ST	BUILDING VAL:	$127,600.00
	DETACH VAL:	$0.00
AMHERST, MA 01002	APPR VAL:	$2,048,920.00
	TAX VAL:	$1,632,990.00



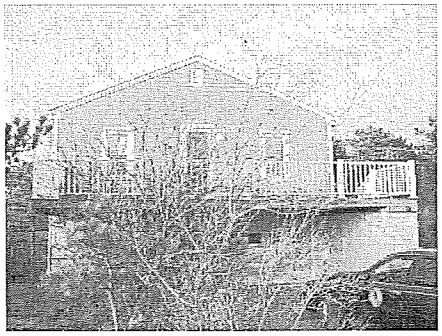
STATE CLASS:	1010	ZONING:	RESIDENTIAL
DESCRIPTION:	Mixed-Res/Chpt	BILL SQ FT:	378841

SALES HISTORY

OWNER	SALE TYPE	BOOK / PAGE	SALE DATE	SALE PRICE
KOSARICK EASTHAM REALTY TRUST	H	29334 / 3	15-Dec-2015	$ 0
KOSARICK FRANCES J TRUSTEE	N	14924 / 344	14-Mar-2002	$ 0
KOSARICK FRANCES J &	N	14525 / 77	04-Dec-2001	$ 0
MUELLER ROSE-JEWELL TRUST		10305 / 160	18-Jul-1996	$ 0

BUILDING #:	1	KEY:	734	LOCATION:	405 HIGGINS RD

YEAR BUILT	1955
STYLE	RANCH
QUALITY	A
NET SF	1144



DATE MEASURED	09-Mar-2011
DATE LISTED	15-Dec-2009

ELEMENT	DESCRIPTION	CD
FOUNDATION	FLR & WALL	4
PRIVATE ROAD	NO	2
EXT. COVER	WOOD	1
ROOF SHAPE	GABLE	1
ROOF COVER	ASPHALT	1
FLOOR COVER	VINYL	5
INT. FINISH	WOOD PANEL	3
HEATING	FORCED AIR	1
FUEL SOURCE	OIL	1

CAPACITY	UNITS
STORIES	1
ROOMS	5
BEDROOMS	3
BATHROOMS	2
HALFBATHS	0
% A/C	0
GARAGE	0
FIXTURES	6

CONDITION ELEMENT	DESCRIPTION	CD
EXTERIOR	AVERAGE	A
INTERIOR	AVERAGE	A
KITCHEN	AVERAGE	A
BATHS	AVERAGE	A
HEAT/ELEC	AVERAGE	A

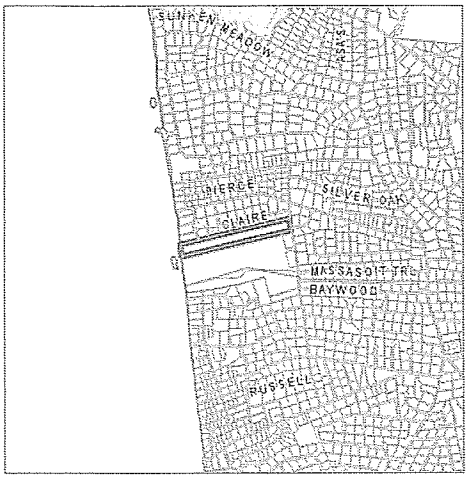
TOWN OF EASTHAM - PROPERTY SUMMARY REPORT

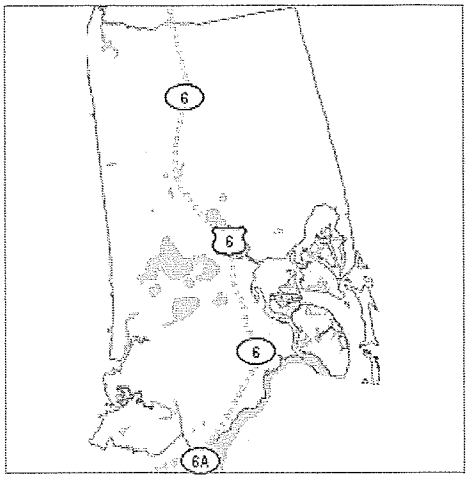
ELEMENT	DESCRIPTION	CD
NBHD	NBHD 80	110

CAPACITY	UNITS

CONDITION ELEMENT	DESCRIPTION	CD

TOWN OF EASTHAM - PROPERTY SUMMARY REPORT





PURCHASE AND SALE AGREEMENT
OF REAL ESTATE

Agreement made this 29th day of October, 2017

1. Parties.

EVERETT A. KOSARICK, Trustee of the Kosarick Eastham Realty Trust, u/d/t dated March 1, 2002, with a mailing address of 34 Shumway Street, Amherst, MA 01002, hereinafter called the SELLER, agrees to SELL, and

KEITH OSBORN and DANA OSBORN, of 1840 Ridgefield Drive, Roswell, GA 30075, hereinafter called the BUYER or PURCHASER agrees to BUY, upon the terms hereinafter set forth, the following described premises:

2. Premises. The land with the buildings thereon located at **405 Higgins Road, Eastham, Barnstable County, Massachusetts.** For a more particular description see deed recorded with the Barnstable County Registry of Deeds in Book 14924, Page 344.

3. Fixtures. Included in the sale as a part of said premises are the buildings, structures, and improvements now thereon, and the fixtures used in connection therewith including, if any, all wall-to-wall carpeting, drapery rods, automatic garage door openers, venetian blinds, window shades, all window treatments, screens, screen doors, storm windows and doors, awnings, shutters, furnaces, heaters, heating equipment, stoves, ranges, oil and gas burners and fixtures appurtenant thereto, hot water heaters, plumbing and bathroom fixtures, garbage disposers, electric and other lighting fixtures, mantels, fences, gates, trees, shrubs and plants, all appliances, as they are and unwarranted. All fixtures and appliances will be in the condition they were in at the time of Buyer's home inspection, reasonable wear and tear excepted.

4. Deed. Said premises are to be conveyed by a good and sufficient quitclaim deed running to the BUYER or to the nominee designated by the Buyer by written notice to the Seller at least seven days before the deed is to be delivered as herein provided, and said deed shall convey a good and clear record and marketable title thereto, free from encumbrances, except

(a) Provisions of existing building and zoning laws;
(b) Such taxes for the then current year as are not due and payable on the date of the delivery of such deed;
(c) Any liens for municipal betterments assessed after the date of this agreement;
(d) Easements, restrictions and reservations of record, if any, so long as the same do not unreasonably prohibit or materially interfere with the current residential use of said premises as a single family dwelling;

5. Plans. If said deed refers to a plan necessary to be recorded therewith the SELLER shall deliver such plan with the deed in form adequate for recording or registration.

6. Registered Title. In addition to the foregoing, if the title to said premises is registered, said deed shall be in form sufficient to entitle the BUYER to a Certificate of Title of said premises, and the SELLER shall deliver with said deed all instruments, if any, necessary to enable the BUYER to obtain such Certificate of Title.

7. Purchase Price. The agreed purchase price for said premises is **TWO MILLION THREE HUNDRED THOUSAND AND 00/100 ($2,300,000.00) DOLLARS**, of which

$	5,000.00	has been paid with the offer to purchase;
$	95,000.00	is to be paid upon receipt of a fully executed waiver of first right of refusal from the Town of Eastham and after expiration of the due diligence period as defined in paragraph 27;
$	2,200,000.00	is due at closing to be paid in cash, certified, cashier's, treasurer's or bank check(s), or attorney's I.O.L.T.A. account check;
$	2,300,000.00	TOTAL

8. Time for Performance. Such deed is to be delivered at **10:00 A.M.** on the on or before the thirty (30) days after the expiration of the Permitting Period or at such earlier date as Buyer may select upon thirty (30) days written notice to Seller (the "Closing Date") at the Barnstable County Registry of Deeds, or the office of the BUYER's or lender's attorney, provided the same is located within Barnstable County, unless otherwise agreed upon in writing. In no event shall the closing take place outside of Barnstable County. It is agreed that time is of the essence of this agreement.

9. Possession and Condition of Premises. Full possession of said premises free of tenants, is to be delivered at the time of the delivery of the deed, said premises to be then (a) in the same condition as they now are, reasonable use and wear thereof excepted, and (b) not in violation of said building and zoning laws, (c) in compliance with the provisions of any instrument referred to in clause 4 hereof, and (d) broom clean and free of debris and personal property not included in the sale. The BUYER shall be entitled personally to inspect said premises prior to the delivery of the deed in order to determine whether the condition thereof complies with the terms of this clause.

10. Extension to Perfect Title or Make Premises Conform. If the SELLER shall be unable to give title or to make conveyance, or to deliver possession of the premises, all as herein stipulated, or if at the delivery of the deed the premises do not conform with the provisions hereof, then the SELLER shall use reasonable efforts to remove any defects in title, or to deliver possession as provided herein, or to make the said premises conform to the provisions hereto, as the case may be, in which event the SELLER shall give written notice thereof to the BUYER at or before the time for performance hereunder, and thereupon the

time for performance hereunder shall be extended for a period of thirty (30) days, or the expiration date of Buyer's mortgage commitment or interest rate lock, whichever occurs first.

11. Failure to Perfect Title or Make Premises Conform, etc. If at the expiration of the extended time the SELLER shall have failed so to remove any defects in title, deliver possession, or make the premises conform, as the case may be, all as herein agreed, or if at any time during the period of this agreement or any extension thereof, the holder of a mortgage on said Premises shall refuse to permit the insurance proceeds, if any, to be used for such purposes, then any payments made under this agreement shall be forthwith refunded and all other obligations of the parties hereto shall cease and this agreement shall be void without recourse to the parties hereto.

12. Buyer's Election to Accept Title. The BUYER shall have the election, at either the original or any extended time for performance, to accept such title as the SELLER can deliver to the said premises in their then condition and to pay therefore the purchase price without deduction, in which case the SELLER shall convey such title except that in the event of such conveyance in accord with the provisions of this clause, if the said premises shall have been damaged by fire or casualty insured against, then the SELLER shall, unless the SELLER has previously restored the premises to their former condition, either

(a) Pay over or assign to the BUYER, on delivery of the deed, all amounts recovered or recoverable on account of such insurance, less any amounts reasonably expended by the SELLER for any partial restoration, or

(b) If a holder of a mortgage on said premises shall not permit the insurance proceeds or a part thereof to be used to restore the said premises to their former condition or to be so paid over or assigned, give to the BUYER a credit against the purchase price, on delivery of the deed, equal to said amounts so recovered or recoverable and retained by the holder of the said mortgage less any amounts reasonably expended by the SELLER for any partial restoration.

13. Acceptance of Deed. The acceptance and recording of a deed by the BUYER or his nominee as the case may be, shall be deemed to be a full performance and discharge of every agreement and obligation herein contained or expressed, except such as are, by the terms hereof, to be performed after the delivery of said deed.

14. Use of Money to Clear Title. To enable the SELLER to make conveyance as herein provided, the SELLER may, at the time of delivery of the deed, use the purchase money or any portion thereof to clear the title of any or all encumbrances or interests, provided that all instruments so procured are recorded in conformance with Barnstable County conveyancing practices.

15. Insurance. Until the delivery of the deed, the SELLER shall maintain the present insurance coverage on said premises.

16. Adjustments. Taxes for the then current fiscal year shall be apportioned as of the day of performance of this agreement and fuel value shall be adjusted, and the net

amount thereof shall be added to or deducted from, as the case may be, the purchase price payable by the BUYER at the time of delivery of the deed.

17. Adjustment of Unassessed and Abated Taxes. If the amount of said taxes is not known at the time of the delivery of the deed, they shall be apportioned on the basis of the taxes assessed for the preceding fiscal year, with a reapportionment as soon as the new tax rate and valuation can be ascertained; and, if the taxes which are to be apportioned shall thereafter be reduced by abatement, the amount of such abatement, less the reasonable cost of obtaining the same, shall be apportioned between the parties, provided that neither party shall be obligated to institute or prosecute proceedings for an abatement unless herein otherwise agreed.

18. Deposits. All deposits made hereunder shall be held in escrow by oldCape Sotheby's International Realty as escrow agent subject to the terms of this agreement, and shall be duly accounted for at the time for performance of this agreement. In the event of any disagreement between the parties, the escrow agent shall retain all deposits made under this agreement pending written instructions mutually given by the SELLER and the BUYER, or by a court of competent jurisdiction.

19. Buyer's Default Damages. If the BUYER shall fail to fulfill the Buyer's agreements herein, all deposits made hereunder by the BUYER shall be retained by the SELLER as liquidated damages. This shall be Seller's sole remedy at law or in equity.

20. Broker's Fee. A broker's fee for professional services of $115,000.00 is due from the SELLER to oldCape Sotheby's International Realty as, only if, as, and when the full purchase price is paid and the deed is delivered for recording.

21. Brokers' Warranty. The Brokers named herein warrant that the Brokers are duly licensed as such by the Commonwealth of Massachusetts.

22. Liability of Trustee, Shareholder, Beneficiary, etc. If the SELLER or BUYER executes this agreement in a representative or fiduciary capacity, only the principal or the estate represented shall be bound, and neither the SELLER or BUYER so executing, nor any shareholder or beneficiary of any trust, shall be personally liable for any obligation, express or implied, hereunder.

23. Warranties and Representations. The BUYER acknowledges that the BUYER has not been influenced to enter into this transaction nor has he relied upon any warranties or representations not set forth or incorporated in this agreement or previously made in writing. Property is being sold in "as-is" condition.

24. Construction of Agreement. This instrument, executed in multiple counterparts, is to be construed as a Massachusetts contract, is to take effect as a sealed instrument, sets forth the entire contract between the parties, is binding upon and enures to the benefit of the parties hereto and their respective heirs, devisees, executors, administrators, successors and assigns, and may be cancelled modified or amended only by

a written instrument executed by both the SELLER and the BUYER. If two or more persons are named herein as BUYER their obligations hereunder shall be joint and several. The captions and marginal notes are used only as a matter of convenience and are not to be considered a part of this agreement or to be used in determining the intent of the parties to it.

25. Lead Paint Law. The parties acknowledge that, under Massachusetts law, whenever a child or children under six years of age resides in any residential premises in which any paint, plaster or other accessible material contains dangerous levels of lead, the owner of said premises must remove or cover said paint, plaster or other material so as to make it inaccessible to children under six years of age.

26. Smoke Detectors and Carbon Monoxide Detectors. The SELLER shall, at the time of the delivery of the deed, deliver a certificate from the fire department of the city or town in which said premises are located stating that said premises have been equipped with approved smoke detectors and carbon monoxide detectors in conformity with applicable law.

27. Due Diligence Period. The obligations of the BUYER are contingent upon the SELLER obtaining a waiver of the first right of refusal from the Town of Eastham. The Due Diligence Period and Permitting Period shall begin within seven (7) days of receipt of the waiver of first right of refusal from the Town of Eastham. BUYER's obligations hereunder shall be contingent upon BUYER's satisfactory determination, through professionals of his choosing and at his expense that:

a. BUYER will reasonably be able to obtain all permits, approvals and permissions, including written approval of the Compact of Cape Cod Conservation Trusts, on terms and conditions satisfactory to BUYER in BUYER's sole discretion, necessary to lawfully construct and occupy a single family dwelling of a design acceptable to BUYER (the "Project");

b. BUYER will be able to determine that it may continue to trim and maintain vegetation within the so-called "building envelope" for preservation of a water view without violating the terms of that certain existing Conservation Restriction, including the ability to communicate with the Restriction holder to determine this fact.

Buyer may notify SELLER or its agent in writing (which may include completed telefax or email) on or before the date that is sixty (60) days after the date SELLER executes this Offer to Purchase (the "Due Diligence Period") if BUYER's sole discretion, to terminate this Agreement because the results of its Due Diligence are unsatisfactory for any reason as determined by BUYER in BUYER's sole and absolute discretion. In the event the BUYER terminates this Agreement in accordance with the terms hereof, the Escrow Agent shall promptly refund all deposits to BUYER, and this Agreement will be void and without recourse to either party. BUYER shall be deemed to have waived this contingency if it is not exercised on or before expiration of the Due Diligence Period.

28. Permitting Period. The purchase price hereunder reflects the intention of the parties that the Premises at BUYER's option be sold and conveyed together with all duly issued and validly existing federal, regional, state and local governments agreements,

certificates, assurances, permits and approvals necessary for the construction and use of the Project (including, without limitation, historic, conservation, zoning. Compact of Cape Cod Conservation Trusts and septic permitting and approvals), all of such agreements, certificates, assurances, permits and approvals having terms and conditions satisfactory to BUYER (in BUYER's sole discretion) and being hereinafter collectively referred to as the "Permits," which Permits shall be obtained by BUYER at BUYER's sole cost and expense.

Accordingly, all of the obligations of the BUYER hereunder are conditional upon the BUYER having obtained all the Permits and all appeal periods from the issuance thereof having expired without any appeal having been taken by a third party, or in the event of any such appeal, that the same be finally adjudicated in favor of the BUYER, or in the event that the BUYER has appealed the denial of any Permits, that the same be finally adjudicated in favor of the BUYER; it being expressly understood and agreed that the BUYER shall assume any cost relative to any such appeals and the defense and pursuit of such appeals. The BUYER shall have sixty (60) days after the expiration of the Due Diligence Period to obtain the Permits (the "Permitting Period"). If BUYER has not yet obtained the Permits, BUYER may, at BUYER's option, extend the Permitting Period for one (1) additional thirty (30) day period by written notice to SELLER prior to the expiration of the Permitting Period. BUYER shall use all reasonably diligent efforts to secure such Permits, but if despite such reasonably diligent efforts the BUYER is not able to obtain the Permits or otherwise complete the Project, the BUYER may, at the BUYER's option, terminate this Agreement by written notice to the SELLER prior to the expiration of the Permitting Period of any extension thereof, whereupon this Agreement is void and without further recourse to the parties hereto and all deposits made hereunder shall be refunded to the BUYER forthwith. The BUYER shall be deemed to have waived this contingency if it is not exercised on or before expiration of the Permitting Period.

The BUYER may, at its option, commence any permitting actions prior to the commencement of the Permitting Period.

At the closing, all Permits to the extent not held or issued to the BUYER and all of the SELLER's rights under such Permits (to the extent SELLER may assign) shall be duly assigned to the BUYER by instrument reasonably satisfactory to the BUYER, without warranty by the SELLER.

29. **Double Walled Oil Tank Contingency:** The SELLERS agree to install at SELLERS' sole expense, a new "town certified" double walled fuel tank before closing if one is not already installed on the premises.

30. **Additional Provisions.**

1. See Addendum A attached hereto.

2. Seller shall remove the woodstove prior to the closing.

FOR RESIDENTIAL PROPERTY CONSTRUCTED PRIOR TO 1978, BUYER MUST ALSO HAVE SIGNED LEAD PAINT "PROPERTY TRANSFER NOTIFICATION CERTIFICATION"

NOTICE: This is a legal document that creates binding obligations. If not understood, consult an attorney.

Seller

Seller

Buyer

Buyer

ADDENDUM A

Mortgage Contingency:
In order to help finance the acquisition of said premises the Buyer shall apply for a conventional bank or other institutional mortgage loan in the amount of 80% of the purchase price, at prevailing rates, terms and conditions. If, despite the Buyer's diligent efforts, a commitment for such loan cannot be obtained on or before **November 30, 2017**, the Buyer may terminate this agreement by written notice to the Seller, and/or the Broker as agent for the Seller, prior to the expiration of such time, whereupon any payments made under this agreement shall be forthwith refunded and all other obligations of the parties hereto shall cease and this agreement shall be void without recourse to the parties hereto. In no event will the BUYER be deemed to have used diligent efforts to obtain such commitment unless the BUYER submits a complete mortgage loan application conforming to the foregoing provisions within 14 days of signing this agreement.

Septic Contingency:
As a condition of the sale, the Seller shall provide at the Seller's expense, a subsurface sewage disposal system inspection report, as required by the State Environmental Code Title 5 and, if applicable, as required by the Board of Health in the Town of Eastham, MA. Should the conclusion of this report indicate that the system is in good working condition, and complies with the requirements of Title 5 of the State Sanitary Code, then the provision of this contingency will be satisfied, and the balance of the Agreement will be held in full force and effect. Should the conclusion of the report indicate that the system is in marginal or failed condition, or not in compliance with said Title 5 requirements, the Seller shall make any repairs necessary in order to put the system in good working order. Should the Seller decline to make said repairs, and fails to provide a compliant Title 5 inspection report, all payments made under this agreement shall be forthwith refunded and all other obligations of the parties shall cease and this agreement shall be void without recourse to the parties hereto. Seller shall inform Buyer if septic fails and requires repair.

Water Test Contingency: Seller shall provide Buyer with both a VOC water quality test and a standard water quality test with the results to conform to the standards set for safe drinking water by the Barnstable County Health Department and Town of Eastham Health Department by on or before the closing date.

Seller | **Seller**

Buyer | **Buyer**

(4)

Date: October 16, 2017

To: Board of Selectmen

From: Jacqueline W. Beebe, Town Administrator

Re: Committee Resignation

Please note the following member from the Town's Committees, Boards and Commissions who has resigned effective 09/29/17.

Cultural Council	**Susan J. Pellowe**	(resigned: 09/29/17)

Info

October 7th 2017
175 Glacier Hills Rd.,
Eastham MA 02642

To the Board of Selectman,

Please accept my resignation from Eastham Natural Council. I have given a written resignation to the Town Clerk but was asked to send another.

Yours sincerely

Sue Bellowe

ADMINISTRATION
OCT 23 2017
RECEIVED

175 Glacier Hills Road
Eastham
Mass 02642
Sept 29th 2017

To whom it may concern,

Although I have not been "sworn in" as a member of Eastham's Cultural Council please accept my resignation: Due to my inability to process my applications etc on my elderly computer, I am unable to serve on this committee

Sue Pellowe
(Susan J Pellowe)

5

TOWN OF EASTHAM

2500 State Highway, Eastham, MA 02642 - 2544
All departments 508 240-5900 *Fax* 508 240-1291
www.eastham-ma.gov

Date: November 6, 2017

To: Board of Selectmen

From: Jacqueline W. Beebe, Town Administrator

Re: Committee Appointment

The following is the information needed for the following committee appointment.

Janna Drake
The Board of Selectmen recommends the appointment of Janna Drake to the Finance Committee as a regular member, replacing Judith Cannon (term ended 6/30/17).

If the Board appoints her, her first term would commence November 6, 2017 and expire June 30, 2020.

TOWN OF EASTHAM
SEARCH COMMITTEE RECOMMENDATION FORM

Committee Applied For: Finance Committee

Applicant Name: JANNA DRAKE
Print

____ **Applicant is well known to the Committee and is recommended for appointment by the Committee Chair/Representative and Board of Selectman Liaison**

____ **Applicant was interviewed by Interview Panel Consisting of Committee Chair/Representative, Search Committee Liaison, Board of Selectman Liaison**
Interview Date and Time: _____

✓ **Applicant recommended** _____ **Applicant not recommended**

Based on the following: Janna Drake has years of experience in Finance and Accounting. She will be calling in for the meetings during the winter while traveling.

MICHAEL W. HACKWORTH
Committee Chair/Rep

Signature of Committee Chair — 31 October 2017
Date

Selectmen Liaison

William F. O'Shea — 10/31/17
Signature of Selectmen Liaison — Date

PAT DONOVAN
Search Committee Liaison

Pat Donovan — 10/31/17
Signature of Search Committee Liaison — Date

The Selectmen Liaison must present this form to the Board of Selectmen

ART AUTORINO
Vice committee chair

Art Autorino — 10/31/17
Signature of vice chair — Date

APPLICATION FOR A STUDENT LOAN FROM THE TIMOTHY SMITH FUND

RECEIVED
NOV 0 1 2017
TOWN OF EASTHAM
TREASURER-COLLECTOR

Date of Application November 1, 2017

Name of applicant Trevor Radke SS# [redacted]

Address 415 Meetinghouse Rd, Eastham, MA 02642 Phone# 508-240-7625

Parent's Name Eric and Lisa Radke

Street Address 415 Meetinghouse Rd, Eastham, MA 02642

Mailing Address Same

Co-Signer Lisa Radke SS# [redacted]

Address and relationship to applicant Mother

Personal References: (name & address & term of acquaintanceship)

1 Danielle Wingate 9838 Lakeview Drive, Newport Richey, FL 34654 Grandmother

2 Jane Ferris 107 Cinema Court, Hamstead, NC 28443 Friend

3 Jacquie Green 122 Upper County Rd, Dennisport, MA 02639 Friend

Name of school or institution you plan to attend University of Northwestern Ohio
Estimated date of graduation August 2018

I have read the terms and conditions and am familiar with the policy and procedure for this loan. Yes (X) No ( )

State briefly the reason for applying for this loan I completed the Associates degree in Automotive Diesel Technology in June 2017. I added an Associates degree in High Performance Automotive to broaden my knowledge to be more diverse in the industry. Due to recent changes in payments for my dependent VA assistance, I need to request another loan from the Timothy Smith Fund to help complete this. I understand this is past the cut off date but would appreciate the board's consideration.

Is this a new loan application? Yes ( ) No (X) Renewal? Yes (X) No ( )
If this is a renewal please include your college transcript.

FOR TOWN OF EASTHAM USE - DO NOT FILL OUT

Date of interview with Selectman _____ Action _____

(Failure to fill in all blanks may cause refusal of loan)

Cutoff date for return of this application is July 1.

(7)

Gillespie-Lee, Laurie

From: Debra DeJonker-Berry <ddejonkerberry@clamsnet.org>
Sent: Wednesday, November 1, 2017 2:12 PM
To: Jacqueline Beebe; Gillespie-Lee, Laurie
Subject: Eastham 2020
Attachments: Wherewillyoubein2020Provincetown.pdf

Jacqui,

Here is a brief summary:

An exploratory group made of of members from the Historical Society, Chamber of Commerce, Town Clerk's Office, CCNS, library and other interested parties has been meeting monthly since the summer. Our purpose has been to do research, find out what other communities/groups are doing, and begin to reach out to them to discuss partnership potentials.

The group has also been brainstorming programs, events, publicity and other ideas. We have agreed that we want this to be an educational opportunity highlighting Eastham history and including the stories of the Pilgrims and Nauset peoples. We also want to have the programs begin in 2018 and continue beyond 2020. We believe this commemoration could revitalize the interest in the history of this area and have impact similar to that of the Bi-Centennial, so we are all very excited.

We believe the peak period for us is the fall of 2020. Provincetown is planning a series of activities, "Exploration Five-Path of the Pilgrims-Thursday, November 12, 2020-December 16, 2020" that will explore this area. Their program outline is attached. We feel we can help host and augment this series and are meeting with David Weidner on November 27th at 10:30 to discuss collaboration. David is also in charge of Provincetown 400.

This is a list of some of the ideas that we have discussed:

-programs such as genealogy workshops, a panel of historians outlining historical events, possibly a series talking about the implications of migration in 1620 and the historical relevance today, an historical re-enactment, walks encouraging us to visualize the 1620 landscape, and a One Book One Town series

-exhibits (crafts, photos, art, history) - some possibly using social media

-broadcasting some programs and using soundbites for PSAs

-audio/bike tour, pamphlet, web-site

-community events such as a community dinner

-possible events sponsored by local restaurants

-a new commemorative plaque or other possibilities at First Encounter Beach

We meet the last Monday of each month at 10:30 at the Library and invite anyone who is interested to join us. Ultimately, we would like to make organizational recommendations for going forward, such as a committee and potential funding to support the commemoration of the 400th anniversary, but feel we need more time to develop a timeline and outline of the events we want to recommend we pursue.

Debbie

Debra DeJonker-Berry
Director
Eastham Public Library
190 Samoset Road
Eastham, MA 02642
508-240-5950
Subscribe to Wowbrary, our weekly online newsletter
Follow us on Facebook

PROVINCETOWN 400
1620-2020

Where will *YOU* be in 2020?

The year 2020 marks the 400th anniversary of the 1620 voyage from Plymouth, U.K. to the New World where the *Mayflower* Pilgrims first landed in what is now known as Provincetown, MA, signed the *Mayflower Compact* popularly believed to have influenced the Declaration of Independence and the U.S. Constitution, and settled at Plymouth, MA. These internationally significant events are the seeds of our nation's democratic values of liberty, justice, and freedom of expression and embody the fabric of Provincetown's identity.

Join us as we tell this story both from the Pilgrim and Wampanoag perspectives and celebrate 400 years of Provincetown's rich history.

Opening Ceremony – Saturday, June 6, 2020

The Opening Ceremony will kick off the 400th commemoration, highlighting the diverse history of Provincetown through historical presentations and multicultural music, theater, and dance performances.

Maritime Festival and Parade of Lights – Saturday, August 29, 2020

This event will feature a maritime parade celebrating Provincetown's rich heritage on the seas, its whaling and fishing industries, and its ties to the United States Navy and United States Coast Guard.

General Society of Mayflower Descendants visit Provincetown – Sunday, September 13, 2020

A VIP Ceremony including dedication of a wreath, re-enactment of the signing of the *Mayflower Compact*, and presentation of new music composition by John Thomas inspired by the words of the *Compact* and Wôpanâak (language of Wampanoag nation) commissioned by Provincetown 400.

The Oceanus Festival – September 6 – November 9, 2020

The Oceanus Festival, named for the one child born on the journey, includes arts, cultural, and heritage events for audiences of all ages about the lives and culture of the Wampanoag and the English colonists.

Landing Commemoration Celebration – Wednesday, November 11, 2020

A gala event will be marking the 400th year since the *Mayflower* Pilgrims stepped in the New World for the first time. We're going to party like it's 1620. Re-enactments, music, and fireworks are planned.

Exploration Five – Path of the Pilgrims – Thursday, November 12, 2020 – December 16, 2020

During Exploration Five, we will honor, commemorate, and understand the path of the Pilgrims throughout the Outer Cape, their interaction with the native peoples, and the cultures of both groups through a series of historical presentations, lectures, educational and entertaining events.

Town of Eastham
Policy for Student Participation on Town Boards & Committees

1.0 Purpose

It is the intent of the Town to create an environment where students and/or residents under the age of 18 feel welcome to participate in local government by serving on Town boards and committees.

2.0 Guidelines

2.1 Advisory Boards

When there is an opening on an advisory board, residents between the ages of 14 and 18 may apply to be members. The normal process of Search Committee interviews will occur and the student may be recommended to the Board of Selectmen for appointment as a regular voting member of the committee. If they are appointed as a regular member, they will have all the normal rights and responsibilities as any other member of the committee.

2.2 Regulatory Boards

The Town has regulatory boards that have statutory authority to make decisions for the Town in their areas of expertise. These include: the Planning Board, the Zoning Board of Appeals, the Board of Health, and the Conservation Commission. Students between the ages of 14-18 may not become appointed members of these committees, but may participate in the process and business of these boards under the following conditions:

- They attend at least 3 meetings, and meet with the Chairman of the Committee;
- The Board votes to allow the student (ad-hoc) member;
- They may listen to, but not participate in the deliberation of cases with the Board.

2.3 Non-Advisory and Non-Regulatory Boards

The Town has many boards that have specific purposes and make recommendations directly to Town Meeting (Community Preservation Committee and Finance Committee) and/or are appointed for a specific purpose as custodians of lands (Open Space, 1651 Committee, Historic, Cemetery, etc.) or by the BOS for specific purposes, such as the Affordable Housing Trust Board. In these cases, where there is an opening on the committee, the student may apply and be eligible for appointment through the normal committee appointment process. If appointed, they would be considered full voting members.

3.0 All Committees Ad-hoc Members

Any Board or Committee may accept interested students as ad-hoc (additional) members of the committee. The student may submit an application, be interviewed and accepted by the committee, and once accepted, participate as an ad-hoc, non-voting member at the discretion of the Chairman.

EXECUTIVE SESSION

INFORMATION

MPO Sub Regional Election – November 20, 2017

At the posted MPO meeting to be held in November (slated for November 20, 2017), the MPO will conduct a sub-regional election for the four sub regional representative seats on the MPO (Sub region A, B, C, and D) for the period January 1, 2018 – December 31, 2020. Each member of the Boards of Selectmen from the following towns will have one vote: Sub region A (Bourne, Falmouth, Mashpee, Sandwich); Sub region B (Dennis, Yarmouth); Sub region C (Brewster, Chatham, Harwich, Orleans); Sub region D (Eastham, Provincetown, Truro, Wellfleet).

Each current member of the Boards of Selectmen for Sub Region A (Bourne, Falmouth, Mashpee, Sandwich); Sub region B (Dennis, Yarmouth); Sub region C (Brewster, Chatham, Harwich, Orleans); Sub region D (Eastham, Provincetown, Truro, Wellfleet) will have the opportunity to vote at the November, 2017, MPO meeting. Those members who are unable to attend the November, 2017 meeting will have the opportunity to vote by absentee ballot. MPO staff will mail absentee ballots to each member unable to attend the November meeting. Those individuals unable to attend the November MPO meeting should send his/her vote in the enclosed self-addressed, sealed envelope to the attention of CCMPO staff, Glenn Cannon no later than 4:00pm on Wednesday, November 15, 2017.

At the November 20, 2017, MPO meeting, the Chair shall conduct each Sub Regional election individually, beginning with Sub Region A, then B, C and D. For each election, the Chair shall take roll call votes from individual members of the Boards of Selectmen for that Sub region in attendance at the meeting. (i.e., Sub region A, from Towns of Bourne, Falmouth, Mashpee and Sandwich), followed by MPO staff opening each individual absentee ballot for each town in that sub region in the posted meeting and announcing the name of the board member and his/her vote. The votes will be tallied for each sub region and the representative with the highest vote in the sub region wins. In the event of a tie, a run-off election will be held between the tied candidates at the December MPO meeting. Selectmen who were unable to attend the meeting will be notified in writing of the MPO election results by MPO staff.

CAPE COD
COMMISSION

Cape Cod Metropolitan Planning Organization (MPO)
Sub Regional Election Process 2017
For Term January 1, 2018 – December 31, 2020
Action Items and Dates

Request for Nominations – October 16, 2017

At the posted MPO meeting to be held on October 16, 2017, the Chair will accept nominations at the meeting for a slate of candidates for consideration for the MPO sub regional representatives for each of the following sub regions of the MPO for a term that runs from January 1, 2018 – December 31, 2020:

Sub region A representative: (Bourne, Falmouth, Mashpee, Sandwich)
Sub region B representative: (Dennis, Yarmouth)
Sub region C representative: (Brewster, Chatham, Harwich, Orleans)
Sub region D representative: (Eastham, Provincetown, Truro, Wellfleet)

Any current sitting member of the Board of Selectmen for each town contained in the sub region may be nominated for consideration (i.e., for sub region A, any selectman from the towns of Bourne, Falmouth, Mashpee or Sandwich may be nominated, for sub region B, any selectmen from Dennis or Yarmouth may be nominated...).

Any current member of a Board of Selectmen in attendance may nominate themselves, any Selectperson from their own town or any of the towns in their Sub Region. Current MPO members in attendance may also nominate any Selectman from any of the towns in the Sub-Region under consideration. The nominated person need not be present to be considered as a candidate.

Once the chair has accepted nominations for all four sub regions, the slate of candidates will be announced at the October MPO meeting. (slated for October 16, 2017)

MPO staff will confirm with each nominated member his/her willingness and ability to serve as a Board member. Should a candidate be unable/unwilling to be on the slate, that person will notify MPO staff and their name will not be placed on the ballot. Should the withdrawal of that name leave a sub region with no candidates, a second request for nominations limited to that Sub region will be held at the regular MPO meeting held in October (currently slated for October 16, 2017), or another MPO meeting held prior to that date.

3225 MAIN STREET • P.O. BOX 226
BARNSTABLE, MASSACHUSETTS 02630

CAPE COD
COMMISSION

(508) 362-3828 • Fax (508) 362-3136 • www.capecodcommission.org

October 20, 2017

Mr. William O'Shea
Board of Selectmen
Town of Eastham
2500 State Highway
Eastham, MA 02642

RE: Cape Cod Metropolitan Planning Organization Sub Regional Election

Dear Mr. O'Shea,

On November 20, 2017, the Cape Cod Metropolitan Planning Organization (CCMPO) will be holding its Sub Regional election for the Town representatives on the CCMPO for the term January 1, 2018 – December 31, 2020. Enclosed is a summary of the Sub regional election process.

As selectman from the Town of Eastham, you have one vote to cast for the candidate of your choice for sub region D, which is comprised of the following towns:
Sub Region D: Towns of Eastham, Provincetown, Truro, and Wellfleet.

At its meeting on October 16, 2017, the CCMPO accepted nominations and finalized the ballot. The candidates running for representative of Sub Region D on the CCMPO are: Aimee Eckman, Robert Weinstein, and Kathleen Bacon.

To cast your ballot, you may attend the election on November 20, 2017 at 1:00pm at the CCMPO meeting at the Cape Cod Commission, 3225 Main Street, Barnstable, MA 02630. In the alternative, you may also vote by marking your choice on the enclosed absentee ballot, placing it in the enclosed self-addressed, stamped envelope, signing the back of the envelope and mailing to my attention to be received no later than by November 15, 2017 at 4:00 pm. Ballots will be opened at the November 20, 2017 CCMPO meeting, and results will be announced.

Please feel free to contact me if you have any questions.

Sincerely,

Glenn Cannon
Technical Services Director

Cc: Jacqueline Beebe, Town Administrator, Town of Eastham
Michael Lorenco, Assistant Town Administrator, Town of Eastham
Laurie Gillespie-Lee, Administrative Assistant, Town of Eastham

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CAPE COD
COMMISSION

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October 20, 2017

Mr. Martin McDonald
Board of Selectmen
Town of Eastham
2500 State Highway
Eastham, MA 02642

RE: Cape Cod Metropolitan Planning Organization Sub Regional Election

Dear Mr. McDonald,

On November 20, 2017, the Cape Cod Metropolitan Planning Organization (CCMPO) will be holding its Sub Regional election for the Town representatives on the CCMPO for the term January 1, 2018 – December 31, 2020. Enclosed is a summary of the Sub regional election process.

As selectman from the Town of Eastham, you have one vote to cast for the candidate of your choice for sub region D, which is comprised of the following towns:
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Please feel free to contact me if you have any questions.

Sincerely,

Glenn Cannon
Technical Services Director

Cc: Jacqueline Beebe, Town Administrator, Town of Eastham
Michael Lorenco, Assistant Town Administrator, Town of Eastham
Laurie Gillespie-Lee, Administrative Assistant, Town of Eastham

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CAPE COD
COMMISSION

October 20, 2017

Mr. Wallace Adams, II
Board of Selectmen
Town of Eastham
2500 State Highway
Eastham, MA 02642

RE: Cape Cod Metropolitan Planning Organization Sub Regional Election

Dear Mr. Adams,

On November 20, 2017, the Cape Cod Metropolitan Planning Organization (CCMPO) will be holding its Sub Regional election for the Town representatives on the CCMPO for the term January 1, 2018 – December 31, 2020. Enclosed is a summary of the Sub regional election process.

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Please feel free to contact me if you have any questions.

Sincerely,

Glenn Cannon
Technical Services Director

Cc: Jacqueline Beebe, Town Administrator, Town of Eastham
Michael Lorenco, Assistant Town Administrator, Town of Eastham
Laurie Gillespie-Lee, Administrative Assistant, Town of Eastham

COUNTY OF BARNSTABLE MASSACHUSETTS

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CAPE COD
COMMISSION

October 20, 2017

Mr. John Knight
Board of Selectmen
Town of Eastham
2500 State Highway
Eastham, MA 02642

RE: Cape Cod Metropolitan Planning Organization Sub Regional Election

Dear Mr. Knight,

On November 20, 2017, the Cape Cod Metropolitan Planning Organization (CCMPO) will be holding its Sub Regional election for the Town representatives on the CCMPO for the term January 1, 2018 – December 31, 2020. Enclosed is a summary of the Sub regional election process.

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Please feel free to contact me if you have any questions.

Sincerely,

Glenn Cannon
Technical Services Director

Cc: Jacqueline Beebe, Town Administrator, Town of Eastham
Michael Lorenco, Assistant Town Administrator, Town of Eastham
Laurie Gillespie-Lee, Administrative Assistant, Town of Eastham

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CAPE COD
COMMISSION

October 20, 2017

Ms. Aimee Eckman
Board of Selectmen
Town of Eastham
2500 State Highway
Eastham, MA 02642

RE: Cape Cod Metropolitan Planning Organization Sub Regional Election

Dear Ms. Eckman,

On November 20, 2017, the Cape Cod Metropolitan Planning Organization (CCMPO) will be holding its Sub Regional election for the Town representatives on the CCMPO for the term January 1, 2018 – December 31, 2020. Enclosed is a summary of the Sub regional election process.

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Please feel free to contact me if you have any questions.

Sincerely,

Glenn Cannon
Technical Services Director

Cc: Jacqueline Beebe, Town Administrator, Town of Eastham
Michael Lorenco, Assistant Town Administrator, Town of Eastham
Laurie Gillespie-Lee, Administrative Assistant, Town of Eastham

Info

Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Stephanie Pollack, Secretary & CEO
Jonathan L. Gulliver, Highway Administrator

MassDOT
Massachusetts Department of Transportation
Highway Division

October 11, 2017

Sheila Vanderhoef
Town of Eastham
2500 State Highway
Eastham, MA 02642

Dear Madam:

SUBJECT: Eastham – Route 6 – 25,000 feet of Water Main Installation – Inspection of Work – Permit #5-2015-0235

Reference is made to the subject permit to access State Highway for the installation of water main on Route 6 in the Town of Eastham.

The District 5 Office has received complaints pertaining to the poor rideability of the newly paved travel lane on Route 6 (southbound, right lane) between Samoset Road and the Eastham/Orleans Rotary that was performed as part of this work during the spring of 2017.

MassDOT, Highway Division personnel performed a site inspection on September 25, 2017, with Town Representatives to determine the amount of settlement at the locations where the water services were installed, including areas where utility structure conflicts (drainage, water) are located. Settlement on the water trenches varied between 1/2 inch and 2 inches. Settlement at water gates was also measured, with a large number not set to the final grade of the roadway. Also, some of the drainage manholes must be adjusted, with the ones near the Rotary having a variance with the roadway between 1 inch and 1-3/4 inches. Please see the attached field data collected on site for your reference.

MassDOT, Highway Division District 5 is forwarding this correspondence requesting that repairs be made as soon as possible for the trenches where excessive settlement of 1-inch or larger has occurred. Monitoring of remaining settlement at the trenches must continue and be addressed as needed.

Furthermore, MassDOT, Highway Division is directing the Town to repave this entire section of the affected roadway in the spring of 2018, once settlement of the trenches and adjustment of the utility structures is addressed.

If you have any questions, please contact the District 5 Highway Maintenance Office at (508) 884-4220.

Sincerely,

Mary-Joe Perry
District Highway Director

ANC: anc
Enclosure
cc: MJP
MEB
Construction
Foreman
File
Ryan J. Trahan, P.E. Environmental Partners, 1900 Crown Colony Drive, Suite 402, Quincy, MA 02169

5-2015-0235e.docx

ADMINISTRATION
OCT 20 2017
RECEIVED

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CAPE COD COMMISSION

TO: Town of Eastham Town Clerk, Building Inspector, Board of Selectmen, Town Administrator, Town Planner, Planning Board, Conservation Commission, Board of Health

FROM: Gail Hanley, Clerk of the Commission

SUBJECT: Town of Eastham District of Critical Planning Concern (DCPC) Designation Decision

DATE: October 16, 2017

At its meeting on October 12, 2017 the Cape Cod Commission approved the Eastham Board of Selectmen's request to propose designation of the Town of Eastham District as a District of Critical Planning Concern (DCPC). The Cape Cod Commission voted unanimously to adopt the written decision designating the Eastham DCPC and forward the designation to the Barnstable County Assembly of Delegates for enactment as a County Ordinance pursuant to Section 10 of the Cape Cod Commission Act.

The Commission's designation decision is being submitted to the Assembly of Delegates and if the proposed Eastham DCPC designation is adopted by the Assembly of Delegates and approved by the Barnstable County Commissioners, the Eastham DCPC County Ordinance will be recorded at the Barnstable County Registry of Deeds and a copy of the Ordinance will be filed with the Town of Eastham at that time. Should you have any questions, please contact Sharon Rooney, Chief Planner at the Cape Cod Commission at (508)362-3828.

Enclosure

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CAPE COD COMMISSION

Town of Eastham
District of Critical Planning Concern Designation Decision

Introduction

As authorized by Section 10 of the Cape Cod Commission Act, the Cape Cod Commission ("Commission") hereby proposes the Town of Eastham District, hereinafter described, for designation as a District of Critical Planning Concern ("District" or "DCPC"). The designation of this District was proposed by the Eastham Board of Selectmen.

The proposed Town of Eastham District qualifies under Section 10(a) of the Cape Cod Commission Act for proposed designation as a DCPC due to the presence of significant natural and economic resources or values of regional, statewide, or national significance; and, the presence or proposed establishment of a major capital public facility or area of public investment.

The purposes of this District are the protection of natural resource interests including the Salt Pond sub-embayment watershed; the improved regulation of economic resources within the Town's major commercial district; improved design and layout of affordable housing resources; transportation management on a Federal/State highway that is a major area of public investment; protection of community character and improved management of development patterns; and to manage growth in a manner that is compatible with the resource management and protection goals for the District.

Procedural Background

On August 24, 2017, the Commission received a proposed nomination for the Town of Eastham District of Critical Planning Concern (DCPC) from the Eastham Board of Selectmen pursuant to Section 10(d) of the Cape Cod Commission Act ("the Act"). Notice of the nomination was published in the Cape Cod Times on August 31, 2017, beginning a full moratorium on the issuance of development permits within the proposed DCPC. On August 31, 2017, the full Commission voted to accept for consideration the proposed nomination as a DCPC, which ended the full moratorium on development within the DCPC and began the limited moratorium as outlined in the August 31, 2017 Commission decision.

As authorized by the Commission's Administrative Regulations, a Commission hearing officer held a duly noticed public hearing on October 3, 2017 at the Eastham Town Hall, Eastham, MA, to take testimony on whether the area should be proposed for designation as a DCPC, and to consider issues and goals related to the designation. The minutes from this public hearing are appended to this decision as Exhibit "A". The public hearing was continued to the full Commission meeting on October 12, 2017, at the First District Courthouse, Assembly of Delegates Chambers, in Barnstable, MA.

A public hearing was held before the full Commission on October 12, 2017, where the Commission voted unanimously to adopt its draft decision that the designation of the Eastham DCPC be forwarded to the Assembly of Delegates for adoption by County ordinance.

Description of Proposed District

The proposed boundary of the District of Critical Planning Concern (hereinafter "DCPC") encompasses commercially zoned land in the Town of Eastham, including District C Industrial, District D Retail Sales and Service, and District E Residential/Limited Commercial, and all land within the North Eastham Overlay District bounded on the north by the Eastham/Wellfleet Town boundary, to the south by Old Orchard Road, to the east by the Cape Cod Rail Trail, and to the west by Herring Brook Road and Massasoit Road. The proposed District consists of approximately 280 acres of land area and approximately 2.9 acres of open water. A map of the proposed District is appended to this Decision as Exhibit "B".

Included within the overall District are approximately 0.46 acres of land owned by the Commonwealth of Massachusetts – Cape Cod Rail Trail, a 10-acre parcel owned by the Town of Eastham, and U.S. Route 6, a federal/state highway right-of-way.

Types of Districts

The Eastham DCPC is designated for the following types of districts:

1. Economic or Development Resource District
2. Affordable Housing Resource District
3. Transportation Management District

Reasons for the District's Designation

The area designated as a DCPC by this decision is of critical concern to the region because of the presence of significant natural and economic resources or values of regional, statewide, or national significance; and, the presence or proposed establishment of a major capital public facility or area of public investment.

The potential for uncontrolled or inappropriate development exists within the District. The proposed District is bisected by a four-lane undivided highway with multiple curb cuts and

higher traffic volumes than other sections of U.S. Route 6. Permissive commercial zoning and the recent provision of town water to the proposed District have resulted in high-traffic volume commercial development proposals whose layout and design could be improved with adequate regulatory controls. Implementing regulations will allow the Town to provide the regulations desired by the community and ensure that this local economic center will grow in a way that existing infrastructure can support.

The Commission finds that the proposed district will preserve and maintain values and resources intended to be protected by the Act. The Commission specifically finds that controlled development within the proposed Town of Eastham District is important for the protection of coastal water quality; balanced economic growth; the provision of adequate capital facilities, including transportation and water supply; the coordination of the provision of adequate capital facilities with the achievement of other goals; the development of an adequate supply of fair affordable housing; and the preservation of architectural values. The Commission finds that there are planning and regulatory tools available which are likely to be effective in protecting or otherwise meeting the objectives of the District and that current regulatory mechanisms are not in place to control growth and development in a manner that would appropriately manage and protect the resources within the proposed District.

The Commission makes the following additional findings regarding the critical concerns in the proposed District:

Water Resources

The southeasterly portion of the proposed District lies within the contributing area to the Salt Pond sub-embayment, within the Nauset Harbor watershed. According to the Final Massachusetts Estuary Project ("MEP") Technical Report for Nauset Harbor, the Salt Pond sub-embayment watershed requires significant nitrogen removal (i.e. removal of 100% of the septic load). An approved Total Maximum Daily Load ("TMDL") report, currently in progress, will require nitrogen reductions in the Salt Pond sub-embayment. Reductions in nitrogen loading within the watershed could be targeted to both development and redevelopment. Stormwater management retrofits or installations of best management practices ("BMPs") within the District that treat for nitrogen would reduce nitrogen loading to Salt Pond and greater Nauset watershed. Additionally, minimizing turf (i.e. fertilizer application), impervious surfaces (i.e. generation of stormwater runoff), and inadequately treated wastewater discharges within the Nauset watershed would help mitigate any increase in nitrogen load to the already-impaired embayments.

Economic Resources

The proposed District is the Town's core commercial area and is primarily zoned for general business use, which allows a variety of retail, accommodations, and other commercial uses. The Town has invested considerable funds into the proposed District by authorizing the design and construction of a one hundred thirty million dollar ($130M) public water supply system throughout the Town. This major public investment will provide town water to all properties

within the proposed District. New development and redevelopment is now more feasible for many property owners within the proposed District, as evidenced by several recent retail and residential development proposals and permits issued by the Town. The advantage to developing the area in a controlled manner includes addressing the impact of future growth on the character of the community.

Provision of Adequate Capital Facilities

The proposed District is bisected by U.S. Route 6, a Federal/State highway that serves as the major travel corridor to the Outer Cape towns of Wellfleet, Truro and Provincetown with average summer daily traffic volumes of approximately 25,000 - 30,000 vehicles/day. Average summer daily traffic volumes on Route 6 at the Wellfleet/Truro town line average 14,000 vehicles/day, and 12,000 vehicles/day at the Truro/Provincetown town line. Summer traffic congestion and safety on Route 6 impacts both residents and visitors daily. The Eastham section of Route 6 consists of a four-lane cross-section with 12-foot vehicle lanes and a 5-foot sidewalk on the west side of the roadway. There are no sidewalks on the east side of the roadway where most of the businesses and numerous curb cuts are located. There are approximately 100 curb cuts along the approximately 2.5-mile section of Route 6 within the proposed District.

The corridor lacks sufficient bicycle and pedestrian accommodations, and has not received upgrades to mitigate traffic volumes, safety issues, and stormwater runoff. As a state highway, Route 6 is under the jurisdiction of the Massachusetts Department of Transportation ("MassDOT") and the Town lacks the capacity and the regulatory framework to implement comprehensive improvements to the roadway.

In 2015, Eastham Town Meeting authorized the design and construction of a one hundred thirty million dollar ($130M) public water supply system throughout the Town. This major public investment will provide town water to all properties within the proposed District. New development and redevelopment is now more feasible for many property owners within the proposed District, as evidenced by several recent retail and residential development proposals and permits issued by the Town.

Provision of Adequate Supply of Fair Affordable Housing

The availability of public transit provided by the Cape Cod Regional Transit Authority ("CCRTA") Flex bus, coupled with the proximity of commercial and retail services along Route 6 and the availability of town water, makes the proposed District an appropriate location for affordable housing. The Town is seeking to diversify its housing stock by promoting mixed-use/village style development. This type of development will provide additional opportunities to accommodate appropriately designed residential units at higher densities, which is a vital component in making the development of affordable housing economically viable within the District.

Preservation of Architectural Values and Appropriate Site Design

In 2014, the Town approved overlay zoning within the proposed District to encourage mixed-use development in a traditional village-style development pattern. The overlay zoning has not yielded any new mixed-use development and the bylaw has not been effective in producing the form and type of development desired by the Town. Permissive commercial zoning and the recent provision of town water to the proposed District have resulted in high-traffic volume commercial development proposals whose impacts, layout and design could be improved with adequate regulatory controls.

Existing Regulatory Framework

The principal existing regulatory framework within the approximately 280-acre proposed District consists of the Eastham Zoning Bylaw, Eastham Subdivision Rules and Regulations, Eastham Wetlands Bylaw and Wetlands Regulations, and Eastham Board of Health Regulations.

Guidelines for Proposed Implementing Regulations

The following guidelines shall serve as the basis for the future establishment of implementing regulations to be adopted by the Town of Eastham pursuant to Section 11 of the Cape Cod Commission Act. In order for the implementing regulations to be approved, they must be found by the Commission to be consistent with the following guidelines.

Goals and Interests

The objective of these Guidelines is to ensure protection of the following goals and interests of the District through the establishment of implementing regulations by the Town of Eastham. The goals and interests of the District are to:

Enhance and protect the character of Eastham's commercial areas.
Encourage mixed-use development.
Support and enhance the local economy in North Eastham.
Improve bicyclist and pedestrian safety and access along the Route 6 corridor.
Minimize traffic conflicts and improve access management throughout the District.
Expand opportunities for creation of affordable housing.
Adopt best management practices to manage nutrients discharged through stormwater within the District.
Support appropriate-scale businesses, as well as compatible public/private institutional uses and maritime uses.

Guideline 1: The town could consider adopting appropriate site layout and design standards to achieve traditional village style development.

Eastham's underlying zoning regulations, including dimensional requirements discourage the compact development form desired by the town in this area. Allowing smaller lot sizes would encourage creation of a higher density village-style design. Reduced setbacks would facilitate improved site design, by allowing buildings to be closer to the street and encouraging parking to be located behind buildings, thereby promoting village character and pedestrian accessibility

The town could develop design guidelines or standards to encourage building and site design that promotes a mix of uses consistent with traditional village style development. The town could adopt building size limits based on the size and scale of existing structures and traditional village style form.

Guideline 2: The town could adopt regulations to encourage creation of a range of affordable housing.

The town could examine existing regulations to encourage a range of appropriately designed affordable housing to meet a range of housing needs.

The town could develop design guidelines or standards to encourage higher density housing consistent with traditional village style residential design.

The town could consider adopting inclusionary zoning that could require new development to provide affordable dwelling units.

The town could consider encouraging creation of affordable accessory units by creating incentives for property owners to add them, such as a by-right allowance.

The Town could review its zoning bylaw and revise it as necessary to incorporate design requirements or guidelines to assist property owners in designing accessory units that would match the existing character of surrounding neighborhoods. Consideration of the adoption of design guidelines could be considered part of a minimum criteria for allowing accessory apartments by-right.

Guideline 3: Development and redevelopment in the District could incorporate best management practices (Low Impact Development) to reduce stormwater impacts to water resources.

New development and redevelopment may increase stormwater impacts to water resources. The town could adopt Best Management practices that are consistent with model LID bylaws.

Guideline 4: Development and redevelopment could promote interconnectivity between properties to improve access for bicyclists, pedestrians, and motorists.

The town could adopt zoning and subdivision regulations to promote shared driveways, reduce curb cuts, and enhance circulation between sites.

Guideline 5: The Town may consider working with the Cape Cod Commission and MassDOT to develop a transportation management plan to address the deficiencies on U.S. Route 6, including adequate pedestrian and bicycle accommodations, access management, intersection safety as well as safety along the corridor.

In addition, the transportation management plan will include a Cape Cod Commission corridor study of Route 6 to determine the best type of roadway system for Eastham (e.g., center turn lanes, a boulevard-type design, traffic signals, etc.). The Cape Cod Commission study is expected to be completed in the fall of 2018.

After concept-level plans have been developed and consensus has been reached on the best plan to move forward, the Town of Eastham, the Cape Cod Commission and MassDOT should work together to implement the design plans. The town may then amend or adopt its implementing regulations based on the results of the study.

Time Frame for Action

The Town of Eastham has one year from the date of the enactment of an ordinance by the Assembly of Delegates establishing the Eastham DCPC to adopt and incorporate implementing regulations that are consistent with the Cape Cod Commission guidelines into its official bylaws, regulations and maps. The Cape Cod Commission may grant an additional ninety-day extension of this time limit and may carry forward implementing regulations on the Town's behalf as provided by Section 11 of the Cape Cod Commission Act.

Conclusion

Based upon the reasons outlined in this decision, the Cape Cod Commission approves the request of the Eastham Board of Selectmen for designation of the Eastham District of Critical Planning Concern and will forward the designation to the Assembly of Delegates for enactment as a County ordinance.

[Signature Page Follows]

SIGNATURE(S)

Executed this 12th day of October 2017

Harold W Mitchell
Signature

Harold W Mitchell - Chair
Print Name and Title

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss October 12, 2017

Before me, the undersigned notary public, personally appeared

Harold W. Mitchell, in his/her capacity as Chairman of the Cape Cod Commission, whose name is signed on the preceding document, and such person acknowledged to me that he/she signed such document voluntarily for its stated purpose. The identity of such person was proved to me through satisfactory evidence of identification, which was [ ] photographic identification with signature issued by a federal or state governmental agency, [ ] oath or affirmation of a credible witness, or [✓] personal knowledge of the undersigned.

GAIL P. HANLEY
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
September 28, 2018

Gail P. Hanley
Notary Public

SEAL

My Commission Expires: 9-28-18

Exhibit A

Minutes from
Eastham District of Critical Planning Concern (DCPC) Hearing
October 3, 2017 at 4:00pm
Eastham Town Hall, Earle Mountain Room
2500 State Highway, Eastham, Massachusetts

Commission Staff Present: Jonathon Idman (Chief Regulatory Officer *as Hearing Officer*), Sharon Rooney (Chief Planner), Jessica Wielgus (Commission Counsel), Glenn Cannon (Technical Services Director), Sarah Korjeff (Historic Preservation Specialist), Martha Hevenor (Planner), and Jeffrey Ribeiro (Regulatory Planner)

Documents Used/Received

1. Commission Staff PowerPoint Presentation, dated 10/3/2017
2. Town Staff PowerPoint Presentation, dated 10/3/2017
3. Eastham DCPC Nomination for Consideration Decision, dated 8/31/2017

Hearing Opened and Presentations

Jonathon Idman, as hearing officer, opened the public hearing at 4:00pm. He introduced the Commission staff present and then read the hearing notice. He provided an overview of the hearing proceedings planned, and then asked for a presentation by Sharon Rooney, Chief Planner of the Commission.

Ms. Rooney presented with the assistance of a PowerPoint presentation, which is attached hereto. Ms. Rooney provided an overview of the purpose of a District of Critical Planning Concern (DCPC) as articulated in the Cape Cod Commission Act, and she said the resources of concern in Eastham are Route 6, the public water supply system, the Town's primary commercial district, areas suitable for affordable housing, and areas within the nitrogen-impacted Salt Pond sub-embayment. She said the DCPC allows for a moratium during which special rules and regulations to protect these resources can be adopted. She said there is significant public engagement, and she said that non-detrimental activities would be allowed to proceed.

Ms. Rooney provided an overview of the proposed DCPC district boundaries. She said the district was for the purposes of Economic Development, Affordable Housing and Transportation Management. She said the Route 6 is a major transportation resources with significant safety issues. She said the Town has invested significant time and effort in planning for North Eastham.

Ms. Rooney then provided an overview of the DCPC process and detailed the exceptions from the DCPC moratorium. She said the purpose of the hearing was to take public testimony on the proposed boundaries of the district, the types of districts proposed, whether the public supports or opposes the designation, and any other issues not articulated that should be considered. She then stated the next step was a vote by the full Cape Cod Commission on October 12th, followed by consideration of the designation by the Assembly of Delegates. She said that if the DCPC is

designated, the Town would have 12 months to adopt implementing regulations, and the Town has indicated that it will seek to have implementing regulations before the annual Town Meeting in May of 2018.

Mr. Idman then asked for comments from Eastham Town Planner Paul Lagg.

Mr. Lagg presented with the assistance of a PowerPoint presentation, which is attached hereto. Mr. Lagg said that recent development has been made feasible by the provision of town water. He said the current zoning by-law does not adequately control the design, type, or size of development and does not include requirements for architectural/site design, affordable housing, or traffic safety improvements. He said cumulative traffic impacts have not been addressed. He reiterated that the reasons for nominating the DCPC were concerns over economic development, affordable housing, and transportation management. He said the Town hopes to support the local economy while maintaining the character of the town, diversify the housing stock through mixed-use development, and improve traffic safety while accommodating multi-modal travel.

Public Comment

Mr. Idman then asked for public comment starting with public officials, followed by those who signed in prior to the hearing, followed by all other members of the public.

Aimee Eckman of the Eastham Board of Selectmen said that she supports the DCPC to promote economic development, affordable housing and transportation safety. She said she hopes the implementing regulations will include support for locally-owned business, limits on formula business, and the inclusion of an architectural review board. She said that Eastham needs high-quality affordable housing with safe site access. She said comprehensive transportation safety analysis is needed at all town intersections, including provisions for safe bicycle/pedestrian access.

Bill O'Shea of the Eastham Board of Selectmen thanked the public for attending the hearing. He said the purpose of the DCPC is not to thwart development but to develop in a way that complements the town. He said that village-style development is needed as well as a comprehensive look at transportation issues.

Martin McDonald of the Eastham Board of Selectmen said the DCPC is important to the town. He said the Board of Selectmen voted unanimously in favor of the DCPC, and he thinks that is the will of the public. He said the designation is needed to protect the character of the town, including the beaches, national park, and unique culture of the town. He said the recent amount of commercial development has been an unanticipated consequence of the new town drinking water system. He said the town needs to define its community characteristics and have a means to control development.

Art Autorino of the Eastham Planning Board said that the overlay district was meant to improve the character of the town and encourage mixed-use development. He said the town needs to develop a plan to allow for development that allows a variety of businesses and uses.

Cynthia Gast says that she owns a cottage colony and may wish to change the use of some of her cottages. She said she supports the DCPC designation, but she says that she has concerns over the ability for her and other small commercial landowners to use their property.

Jamie Rivers said that she supports the designation of the DCPC. She said that she does not think that town has difficulty bringing business to town, but she does think the town has difficulty supporting small businesses. She said small businesses must be supported to maintain the character of the town.

Steve Wasby of the Eastham Zoning Board of Appeals said he favors the designation of the DCPC but does not think implementing regulations should be rushed. He said the Town's zoning by-laws should be looked at comprehensively, and a better timeline would be for the Town to call a special Town Meeting in the fall of 2018 to adopt implementing regulations or to wait for the annual Town Meeting in May of 2019.

Dave Schroepfer said he is a former selectman and a current member of the board of the Cape Cod Regional Transit Authority. He said he supports the DCPC but does not think implementing regulations can be adopted by the spring of 2018. He said safety and character are both concerns for Route 6. He said affordable housing is needed but should be small scale. He said he is concerned about crime associated with affordable housing. He said Route 6 should be designed for motorist, pedestrian and cyclist safety in a two-lane configuration. He said a bypass road is needed to re-route through traffic. He said he is in support of the formation of an architectural review board.

Jacqueline Beebe, Eastham Town Manager, responded to concerns from the public about the timing of the adoption of implementing regulations. She said there is a need to balance time for planning with the potential for negative impacts to small businesses. She said the plan is to get as much accomplished by the annual Town Meeting, with additional planning work to continue into the future.

Mr. Idman added that the Commission's designation would not compel the Town to act by May of 2018.

Scott Kerry said he supports the designation. He said the Town needs the planning and technical services of the Commission to help the Town in its efforts.

Bonnie Nuendel asked if it would be possible to get affordable housing developers to consider mixed-use projects, if a traffic light was possible at the proposed Governor Prence Residences project, and if the Town's Housing Production Plan would be used in the DCPC planning efforts. She also said that traffic on Route 6 should be slowed, and Rock Harbor Village in Orleans is an example of a successful affordable housing development.

Edward Schneiderhan of the Eastham Zoning Board of Appeals said that one of the reasons a recent Comprehensive Permit application was denied was due the development being over two stories in height. He asked if the DCPC process could create binding design requirements for Comprehensive Permit projects.

Steve Wasby of the Eastham Zoning Board of Appeals added that he was sympathetic to impacts to small businesses but thinks all regulations should be looked at comprehensively. He said it would not be easy to update the by-laws as needed on an iterative basis.

Barbara Nigel said that she agrees with Ms. Beebe and Ms. Rivers that the implementing regulations should be ready for May Town Meeting. She said she thinks it can be done.

Jamie Rivers said that the Town and the Commission have been being very transparent and providing significant information to the public. She said the problem with past efforts has been initiatives not providing such information to the public.

Responses to Comments

Mr. Idman asked if Mr. Lagg had further comment or wanted to respond to questions from the public. Mr. Lagg said that the Town would be in the best position to control Comprehensive Permit applications if it achieves the state mandate of 10% of year-round housing units as affordable. He said until that is achieved the Town will be subject to projects under MGL Chapter 40B. He said implementing regulations will need to encourage mixed-use development, and, in some scenarios, perhaps require the provision of affordable housing units. He said accessory dwelling units will be important, as the biggest need is for affordable rental units. He said smaller-scale development can be encouraged by allowing such development as of right and not by special permit. He said the Housing Production Plan will be the playbook for the creation of housing in the Town and must be incorporated into the zoning by-law.

Ms. Rooney then offered further comment and said that Ms. Gast should consult Mr. Lagg and the Town's building commissioner about whether her specific projects would be exempted from the moratorium. She said Commission staff was already analyzing the Town's zoning by-laws under a District Local Technical Assistance grant project, which will be completed by the end of the year. She said the Town will have up to 12 months to adopt implementing regulations, if needed. She noted that a recent Urban Land Institute charrette was also completed, which will produce a report with further recommendations within 6 weeks. She said mixed-use affordable housing is already being constructed on Cape Cod, specifically at Mashpee Commons. She then asked Glenn Cannon, Technical Services Director, to comment on transportation issues.

Mr. Cannon said a lot of work is currently being done, and he said the Town is taking the correct actions to outline short-, medium-, and long-term steps that will be needed. He said the Commission will be working to figure out what exactly the Town wants for Route 6 so that can be clearly conveyed to MassDOT. He said that the traffic functions as part of a network, and no one piece of infrastructure would be effective to address all transportation issues on Route 6.

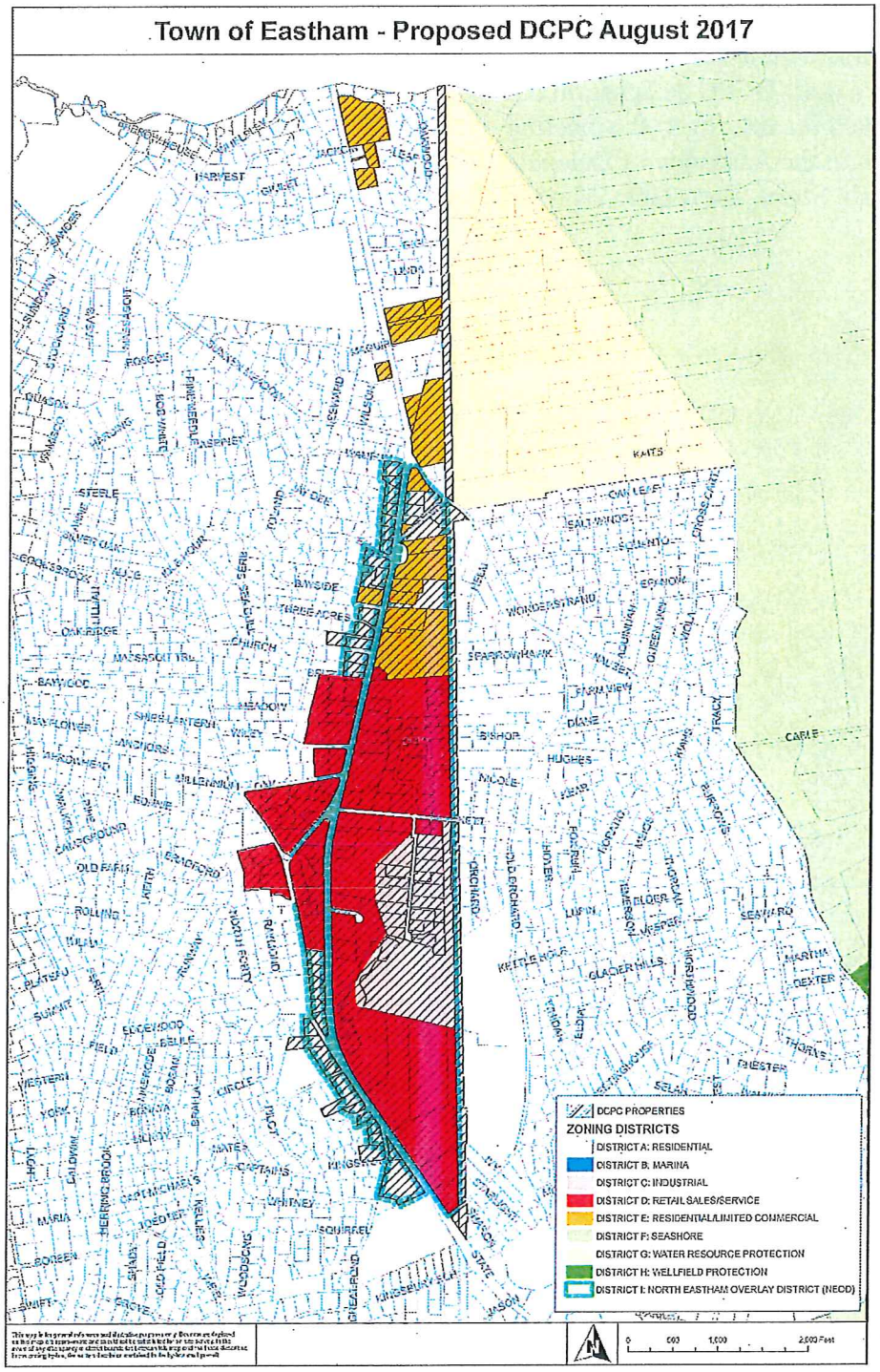
Mr. Idman noted that Comprehensive Permit applications do not come under the jurisdiction of the DCPC. He said that consistency with any adopted implementing regulations will be something that is looked at by the state when considering waivers for Comprehensive Permit applications.

Continuance

Mr. Idman provided an overview of the next steps in the DCPC designation process. He noted that there would be additional opportunity to comment at the continued hearing before the full Cape Cod Commission board on October 12th. He said that written comments could be submitted as well. He also noted that all materials for the DCPC can be viewed on the Commission's website, including a draft DCPC designation decision that will be posted later in the week. Mr. Idman then continued the hearing to the meeting of the full Cape Cod Commission on October 12, 2017 at 3:00pm in the Assembly of Delegates Chamber at the First District Courthouse located at 3195 Main Street, Barnstable, Massachusetts. The hearing was adjourned at 5:20pm.

Exhibit B

Map of Proposed DCPC Boundaries



TOWN OF EASTHAM

2500 State Highway, Eastham, MA 02642 - 2544
All departments 508 240-5900 *Fax* 508 240-1291
www.eastham-ma.gov

October 18, 2017

Catherine Racer
Associate Director
Massachusetts Department of Housing and Community Development
Division Housing Development
100 Cambridge Street, Suite 300
Boston, MA 02114

Re: Town of Eastham – Pennrose Site Control

Dear Ms.Racer:

I am writing on behalf of Pennrose Properties, LLC ("Pennrose") concerning their response to our solicitation for a developer to develop affordable rental housing on a town owned parcel at 4300 State Highway, Eastham. After evaluating Pennrose's proposal, including discussing the specifics of the Project with Pennrose, the Board of Selectmen, by letter dated June 14, 2016, selected the Pennrose proposal and expressed their intent to lease the Property for the Project on the terms set forth in the RFP and on such other reasonable terms that are acceptable to both the Town and Pennrose.

The town sought the authority to issue a 99-year lease to Pennrose Properties based on the authorization voted as Article 30, Annual Town Meeting, held May 2, 2016. The Article stated:

> To see if the Town will vote to authorize the Board of Selectmen to enter into a ground lease for affordable housing purposes for a term of up to 99 years, for two adjacent parcels of land (formerly owned by Purcell) consisting of a total of 11.2 acres more or less, and as shown on Eastham Assessor's Map 8, Parcel 147 and 147A, on such terms and conditions as the Board of Selectmen deem appropriate; or take any action relative thereto.

The Town executed a Memorandum of Agreement which is enclosed and the Zoning Board of Appeals issued a permit for the project to proceed.

Pennrose is hereby granted control of the site only for the purpose of developing affordable rental in accordance with the response dated May 5, 2016 and the Memorandum of Agreement with the Town. The Town looks forward to working with Pennrose to create much-needed affordable rental housing in the Town.

Very truly yours,

Jacqueline W. Beebe
Town Administrator
On behalf to the Eastham Board of Selectmen

cc: Board of Selectmen
Paul Lagg, Eastham Town Planner

TOWN OF EASTHAM
2500 State Highway, Eastham, MA 02642 - 2544
All departments 508 240-5900 *Fax* 508 240-1291
www.eastham-ma.gov

October 19, 2017

Ms. Catherine Racer, Associate Director
Massachusetts Department of Housing & Community Development
Division Housing Development
100 Cambridge Street, Suite 300
Boston, MA 02144

RE: Cambell-Purcell Housing Development

Dear Ms. Racer,

When the Town purchased land for affordable housing almost ten years ago, we had no idea that we would still be struggling to develop adequate affordable housing for our residents in 2017. The proposed Cambell-Purcell Development that is currently under review for funding, is the best possible result of this extended struggle. The development as planned by Pennrose Properties, is a true partnership between the Town and the developer. Pennrose has listened, learned about the community, and as a result, designed a development that will allow residents to live and thrive in our Town. The Cambell-Purcell Development allows for community green spaces, walking trails, access to stores, banks and post office, access to the bike trail and public transportation. It is a perfect location and will create a new neighborhood that will allow families, workers, and seniors high quality, accessible housing.

The development is fully supported by both town officials and residents, who have already voted to give $300,000 in CPC funds to the development. The Town has also partnered to provide land, and $400,000 of in-kind funding and has a strong commitment to this development. Pennrose has taken our vision of what safe, affordable housing might be in our community and made it an attractive reality. I understand that your agency has many worthy projects to fund in areas where there is much need. As a rural community, with little affordable housing and a housing market that is as strong as a large city in terms of real estate prices, I would suggest that we have significant need and few resources to address the need.

On behalf of the Eastham Board of Selectmen, I urge you to do everything possible to fund this development for our community.

Sincerely,

Bill O'Shea, Chairman
Eastham Board of Selectmen

Cape Light Compact JPE
261 Whites Path, Unit 4, South Yarmouth, MA 02664
Energy Efficiency 1.800.797.6699 | Power Supply 1.800.381.9192
Fax: 774.330.3018 | capelightcompact.org

October 13, 2017

Ms. Jacqueline Beebe
Town Administrator
2500 State Highway
Eastham, MA 02642

Dear Ms. Beebe,

Attached for your information and dissemination to your Board of Selectmen/Town Council is the Cape Light Compact's monthly Energy Efficiency Report. The Report reflects the program activity for all of Cape Cod & Martha's Vineyard and breaks out the detail on a town-by-town basis.

Below is a summary of the activity in your town for the month of October, 2017. To view each of your monthly reports, please visit our website at www.capelightcompact.org/reports.

- *35 residents and/or businesses in Yarmouth participated in the program.*
- *15411 in incentive dollars were distributed to the 361 participants.*
- *20244 kWh were saved through implementation of these energy efficiency measures.*

If you have any questions on the attached report, please contact me at (508) 375-6636.

Sincerely,

Margaret T. Downey

Administrator

Enclosure

cc: Fred Fenlon

Energy Efficiency Program Activity by Town

Town Name: EASTHAM
Program Period: 2017
Current Dates: 8/1/2017 - 8/31/2017
Cumulative Dates: 1/1/2017 - 8/31/2017

	Current Period			Cumulative Period				
Program Initiative	Annual kWh Savings	Actual Expenditures	Participants	Annual kWh Savings	Actual Expenditures	Participants	Budget	Actual % of Budget
Residential New Construction	8,051.40	$6,168.32	6	6,502.53	$21,728.32	7	$0.00	0.00%
Residential New Construction (Low-Income)	0.00	$0.00	0	0.00	$0.00	0	$0.00	0.00%
Residential Multi-Family Retrofit	0.00	$0.00	0	0.00	$0.00	0	$0.00	0.00%
Residential Home Energy Services - Measures	5,235.10	$1,484.37	4	219,809.40	$215,032.57	157	$264,096.70	81.42%
Residential Home Energy Services - RCS	0.00	$3,805.00	17	0.00	$29,430.00	118	$33,789.11	87.10%
Residential Behavior/Feedback Program	0.00	$0.00	0	0.00	$0.00	0	$0.00	0.00%
Residential Heating & Cooling Equipment	319.00	$410.50	2	21,816.60	$13,373.00	28	$0.00	0.00%
Residential Consumer Products	2,088.00	$150.00	3	26,650.00	$4,380.00	61	$0.00	0.00%
Residential Lighting	0.00	$0.00	0	114,733.40	$17,216.42	1,618	$0.00	0.00%
Residential HEAT Loan	0.00	$0.00	0	0.00	$18,246.76	17	$0.00	0.00%
Res Subtotal	15,693.50	$12,018.19	32.00	389,511.93	$319,407.07	2,006	$297,885.80	
Res % of Total	77.52%	77.98%	91.43%	66.65%	73.52%	98.24%	57.26%	
Low-Income Single Family Retrofit	4,551.10	$2,788.72	2	27,668.90	$29,250.51	18	$73,629.05	39.73%
Low-Income Multi-Family Retrofit	0.00	$0.00	0	0.00	$241.97	1	$0.00	0.00%
LI Subtotal	4,551.10	$2,788.72	2.00	27,668.90	$29,492.48	19	$73,629.05	
LI % of Total	22.48%	18.09%	5.71%	4.73%	6.79%	0.93%	14.15%	
C&I New Buildings & Major Renovations	0.00	$0.00	0	56,300.00	$23,987.00	2	$0.00	0.00%
C&I New Buildings & Major Renovations - Municipal	0.00	$0.00	0	0.00	$0.00	0	$0.00	0.00%
C&I Initial Purchase & End of Useful Life	0.00	$0.00	0	0.00	$0.00	0	$0.00	0.00%
C&I Upstream HVAC	0.00	$0.00	0	15,369.10	$1,577.30	1	$0.00	0.00%
C&I Existing Building Retrofit - LARGE	0.00	$0.00	0	0.00	$0.00	0	$0.00	0.00%
C&I Existing Building Retrofit - MEDIUM	0.00	$0.00	0	41,244.56	$16,065.17	1	$79,511.41	20.20%
C&I Existing Building Retrofit - Municipal	0.00	$0.00	0	44,938.92	$40,308.45	1	$0.00	0.00%
C&I Small Business	0.00	$0.00	0	0.00	$1,375.00	5	$69,178.64	1.99%
C&I Multifamily Retrofit	0.00	$605.00	1	0.00	$605.00	1	$0.00	0.00%
C&I Multifamily - Municipal	0.00	$0.00	0	0.00	$0.00	0	$0.00	0.00%
C&I Upstream Lighting	0.00	$0.00	0	9,416.18	$1,626.00	6	$0.00	0.00%
C&I Subtotal	0.00	$605.00	1.00	167,268.76	$85,543.92	17	$148,690.06	
C&I % of Total	0.00%	3.93%	2.86%	28.62%	19.69%	0.83%	28.58%	
Total	20,244.60	$15,411.91	35	584,449.59	$434,443.47	2,042	$520,204.91	

*Costs include those costs that has been recorded through this period and are not necessarily representative of all activity through this month
**All information presented is preliminary and subject to change.

Info

TOWN OF EASTHAM

2500 State Highway, Eastham, MA 02642 - 2544
All departments 508 240-5900 *Fax* 508 240-1291
www.eastham-ma.gov

October 18, 2017

Mae-Ellen Gavin
10 University Rd
Arlington MA 02474

Dear Mae-Ellen,

Thank you for paying off your account with the Timothy Smith Loan Fund, in the amount of $61.50 on October 17, 2017. This pays your account in full. Enclosed please find the original promissory note signed by you, marked "PAID" for this your records, and the record of the payments received by you from 12/7/1987 to 5/3/1988.

Again, thank you for repaying this loan as it will afford other students in the Town of Eastham the same opportunity for furthering their education.

Sincerely,

William O'Shea, Chairman
Board of Selectman as
Trustees of the Timothy Smith Fund

cc: Board of Selectman

Info

Cape Light Compact JPE
261 Whites Path, Unit 4, South Yarmouth, MA 02664
Energy Efficiency 1.800.797.6699 | Power Supply 1.800.381.9192
Fax: 774.330.3018 | capelightcompact.org

October 19, 2017

BY: Federal Express

Jacqui Beebe
Town Administrator
Town of Eastham
2500 State Highway
Eastham MA 02642

Dear Ms. Beebe:

At its October 11, 2017 meeting, the Governing Board of the Cape Light Compact JPE (the "Compact") voted to provide notice to its Members that it intends to make certain amendments to the Joint Powers Agreement ("JPA"). The vote to adopt the proposed amendments will take place at the December Governing Board meeting, or at later date if the Governing Board decides that a later date is more desirable or appropriate.

While the power to amend the JPA generally lies with the Governing Board, the Members are required to be given advance notice under Article XV of the JPA which provides for at least thirty days advance written notice prior to taking a Governing Board vote to adopt such amendments.

The Governing Board will vote to amend the JPA as follows:

1. Article I(A) of the JPA will be amended to change the Effective Date to April 12, 2017. More specifically:

   In the first and second sentences, the following words will be deleted:

   "such date as this Agreement is executed by at least two (2) municipal members of the Compact after authorization by each municipal member's Board of Selectmen or other governing body as set forth in G.L. c. 40, §4A½ (as may be amended from time to time, the "Joint Powers Statute"). Such date shall be referred to herein as"

   The words "April 12, 2017" will be inserted in its place.

2. Article XVIII of the JPA will be amended through insertion of a new subsection to clarify that certain provisions in such Article have no future operational effect as the

transition has been completed and to state that the operational transfer date was July 1, 2017[1]. More specifically, the following subsection (E) will be inserted:

E. Completion of Transition and Reorganization

The foregoing subsections (A) – (D) have no future operational effect as of [December 13, 2017] the effective date of this Agreement. They remain in this Agreement as a placeholder and for historical context. The operational transfer date was July 1, 2017[FN]. On that date, the Cape Light Compact JPE became the legal and operational successor to the Compact.

[1] On April 12, 2017, the Governing Board voted to establish the operational transfer date as July 1, 2017.

3. Certain scriveners/typographical errors in the JPA will corrected and other clarifying edits will be made. More specifically:

   (i) After the reference to G.L. c. 40, § 4A½ in the last recital, the following words "(as may be amended from time to time, the "Joint Powers Statute")" will be inserted.
   (ii) In last sentence of Article I(E), the word "Municipal" will be deleted and replaced with "County."
   (iii) In the third sentence of Article V(C), the words "Board of Directors" will be deleted and replaced with "Governing Board."
   (iv) In the third sentence of the second paragraph of Article V(G)(2), the word "Board" will be inserted after the word "Governing."
   (v) In the third sentence of Article VI(E), the words "or County Representative" will be inserted after the word "Directors."
   (vi) In the second sentence of second paragraph of Article XI, the words "the Members'" will be replaced with the words "each Member's."
   (vii) In Article XIX(D), the Compact's mailing address will be changed to 261 Whites Path, Unit 4, South Yarmouth, MA 02664.
   (viii) In the third sentence of Article XIX(E), the punctuation error in the word "shall" will be corrected.
   (ix) In the first sentence of Article XIX(I), the word "more" will be inserted after the words "which may be one or."

4. In order to effectuate the foregoing amendments, the JPA will be replaced with the First Amended and Restated dated as of [December 13, 2017] and the recitals will be amended to reflect the second iteration of the JPA.

A redline of the proposed First Amended and Restated JPA is attached for your review and consideration.

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[1] Compact counsel notes that the JPA does not need to be formally amended in order for the operational transfer date to be effective as of July 1, 2017 as the original language in the JPA vested the power in the Governing Board to establish the date. However, going forward, for administrative convenience and clarity, it makes sense to officially amend the JPA to incorporate the Governing Board vote. To be clear, the operational transfer date was established as of July 1, 2017 effective as of the April 12, 2017 Governing Board vote on the matter.

Members having any comments on the proposed amendments are being asked to provide them to their Director in advance of the December meeting. Compact counsel is also available to answer questions from your town counsel.

Please let me know if you have any questions.

Sincerely,

Margaret T. Downey
Cape Light Compact JPE Administrator

Enclosure

Cc: Fred Fenlon, Eastham CLCJPE Director, via email

[Red text denotes proposed new language; ~~strikethrough text~~ denotes proposed deletions.]

FIRST AMENDED AND RESTATED
JOINT POWERS AGREEMENT
OF THE
CAPE LIGHT COMPACT JPE

(December 13, 2017)

[Note: The JPA date will be the first Governing Board meeting date following the thirty day notice to member period as which the vote on amendments will be taken. November 8, 2017 is the current anticipated date.]

****

This First Amended and Restated Joint Powers Agreement ("Agreement") is effective as of ~~the date set forth in Article I(A) (Effective Date; Formation) below~~ December 13, 2017, and is entered into by and among the municipalities and counties listed on Exhibit A hereto (the "Members"), pursuant to the authority of Massachusetts General Laws Chapter 40, §4A ½ and G.L. c. 164, §134.

WHEREAS, the Massachusetts Restructuring Act of 1997 (the "Act") was enacted during a period where Federal Law allowed for the restructuring of existing electric utilities into separate generation, transmission and distribution companies and, accordingly, the Act set forth a framework for the competitive supply of electric generation service to Massachusetts electric customers and allowed electric customers to choose their electric power supplier; and

WHEREAS, the Cape Light Compact ("Compact") was entered into with the County of Barnstable, County of Dukes County and the municipalities legally joining therein, pursuant to the authority of Massachusetts General Laws Chapter 40, §4A, through an original Inter-Governmental Agreement effective as of October, 1997 which has been amended from time to time (most recently in November of 2015) and is due to expire in October of 2022 (the "IGA"); and

WHEREAS, under the authority of G.L. c. 164, §134, G.L. c. 25A, §6 and pursuant to the original Inter-Governmental Agreement, adopted October, 1997, as amended, the Compact developed a municipal aggregation plan, setting forth the structure, operations, services, funding and policies of the Compact, approved in D.T.E. 00-47 (August 10, 2000) and approved as updated in D.P.U. 14-69 (May 1, 2015; May 18, 2015); and

WHEREAS, the Compact currently operates a municipal aggregation competitive supply program pursuant to a municipal aggregation plan, setting forth the structure, operations, services, funding and policies of the Compact as most recently approved and updated in D.P.U. 14-69 (May 1, 2015; May 18, 2015) which provides electric power supply on an opt-out basis to

customers across all customer classes located on Cape Cod and Martha's Vineyard and the Compact also provides comprehensive energy efficiency services to Cape Cod and Martha's Vineyard through the Cape Light Compact Energy Efficiency Plan; and

WHEREAS, it is in the best interests of the Compact's members to transfer its administrative, fiscal and operational functions to a new independent legal entity, a joint powers entity, prior to expiration of the IGA; and

WHEREAS, members of joint powers entities are afforded express liability protection from the acts and omissions of the entity and the other participating members; and

WHEREAS, joint powers entities are conferred many express powers by law that are not available to the Compact, including the ability to employ staff; and

NOW THEREFORE, the Members hereby enter into this Agreement and, pursuant to G.L. c. 40, § 4A½ (as may be amended from time to time, the "Joint Powers Statute"), hereby form a body politic and corporate.

ARTICLE I: EFFECTIVE DATE; FORMATION; MEMBERSHIP; LIABILITY OF MEMBERS

A. Effective Date; Formation.

This Agreement shall become effective and the joint powers entity shall exist as a separate public entity on ~~such date as this Agreement is executed by at least two (2) municipal members of the Compact after authorization by each municipal member's Board of Selectmen or other governing body as set forth in G.L. c. 40, §4A½ (as may be amended from time to time, the "Joint Powers Statute"). Such date shall be referred to herein as~~ April 12, 2017 (the "Effective Date.") Each Municipal Member shall provide a duly authorized signature page for attachment hereto. There is formed as of the Effective Date a separate public entity named the Cape Light Compact JPE. The Cape Light Compact JPE shall provide notice to the Members of the Effective Date. The Cape Light Compact JPE shall continue to exist, and this Agreement shall be effective, until this Agreement is terminated or expires in accordance with Article XVI (Term; Termination; Withdrawal), subject to the rights of the Members to withdraw from the Cape Light Compact JPE.

B. Eligibility for Membership; Addition of Members.

Municipal members of the Compact are eligible for full membership in the Cape Light Compact JPE. Municipal members of the Compact who become members of the Cape Light Compact JPE shall be referred to as "Municipal Members." Barnstable County and Dukes County may participate as limited members as set forth in Article I(E) (County Members) below. This subsection may not be amended unless such amendment obtains the affirmative approval of the Municipal Members whose population is at least equal to 50% of the combined population of all of the Municipal Members of the Cape Light Compact JPE. Subject to the deadlines set forth

in Article XVIII(C) (Transfer of Operations), a municipal member of the Compact may become a member of the Cape Light Compact JPE by duly executing this Agreement in accordance with the Joint Powers Statute and delivering an executed copy of this Agreement and a copy of the authorization, vote or resolution as required by the Joint Powers Statute to the Cape Light Compact JPE. The Members acknowledge that membership in the Cape Light Compact JPE may change by the addition and/or withdrawal of Members. The Members agree to participate with such other Members as may later be added. The Members also agree that the withdrawal by a Member shall not affect this Agreement or the remaining Members' continuing obligations under this Agreement.

C. Region.

The region within which the powers and duties provided in this Agreement shall be exercised is Barnstable County and Dukes County. The foregoing sentence shall not be construed as a limitation on the Cape Light Compact JPE's powers in any way, including, but not limited to, its power to offer statewide programs or participate in statewide proceedings (as such programs or proceedings may affect the region), or its power to contract with persons or entities outside the Commonwealth of Massachusetts.

D. Liability of Members.

Members shall not be liable for the acts or omissions of other Members or the region or the Cape Light Compact JPE created by this Agreement, unless the Member has agreed otherwise in this Agreement, or as may be provided for in a separate contract between the Member and the Cape Light Compact JPE. This subsection may not be amended unless such amendment obtains the affirmative approval of the Municipal Members whose population is at least equal to fifty percent (50%) of the combined population of all of the Municipal Members of the Cape Light Compact JPE.

This Agreement is not intended to impose any independent financial liabilities on the Members. Each Member shall remain responsible for its own debts and other financial liabilities, except as specifically provided herein, or as may be provided for in a separate contract between a Member and the Cape Light Compact JPE.

E. County Members.

Barnstable County and Dukes County may participate as limited members of the Cape Light Compact JPE and shall be referred to herein as the "County Members," or collectively with the Municipal Members as the "Members." The County Members shall not be permitted to vote on matters concerning aggregated power supply, energy efficiency plans and programs or other such matters committed to municipal aggregators pursuant to any provision of the Massachusetts General Laws. Other limitations on the participation rights of County Members are set forth elsewhere in this Agreement.

A county member of the Compact may become a member of the Cape Light Compact JPE by duly executing this Agreement in accordance with the Joint Powers Statute. Each County ~~Municipal~~ Member shall provide a duly authorized signature page for attachment hereto.

ARTICLE II: GOALS; POLICIES; PURPOSES

The Cape Light Compact JPE's goals, policies and purposes include, without limitation, the following:

a) providing the basis for aggregation of all consumers on a non-discriminatory basis;

b) negotiating the best terms and conditions for electricity supply and transparent pricing;

c) exploring all available options for negotiating the best terms and conditions for electricity supply and the development of renewable energy resources, including, without limitation, the formation of and/or membership in a co-operative organization to purchase or produce energy or renewable energy certificates ("RECs") or both, on a long-term basis;

d) providing equal sharing of economic savings based on current electric rates and/or cost-of-service ratemaking approved by the Department of Public Utilities or its successor ("DPU");

e) providing and enhancing consumer protection and options for service under contract provisions and to allow those consumers who choose not to participate to opt-out;

f) improving quality of service and reliability;

g) encouraging environmental protection through contract provisions;

h) utilizing and encouraging renewable energy development to the extent practicable through contract provisions, demonstration projects and state mandated system benefit charges for renewable energy;

i) administering an energy efficiency plan that advances consumer awareness and the adoption of a wide variety of energy efficiency measures and that also utilizes and encourages demand side management, all through contract provisions, demonstration projects and the use of state mandated system benefit charges for energy efficiency and other related charges and funds;

j) advancing specific community goals that may be selected from time to time, such as placing utility wires underground;

k) providing full public accountability to consumers; and

l) utilizing municipal and other powers and authorities that constitute basic consumer protection to achieve these goals.

The Cape Light Compact JPE shall accomplish the foregoing purposes through the following: (i) operation of energy efficiency programs; (ii) developing or promoting the development of renewable energy resources and projects; (iii) procuring competitive electric supply for its customers; (iv) procuring RECs; (v) participating in regulatory and legislative proceedings; and (vi) consumer advocacy.

ARTICLE III: POWERS OF THE CAPE LIGHT COMPACT JPE

The Cape Light Compact JPE is a body politic and corporate with power to:

a) sue and be sued;

b) make, negotiate and execute contracts and other instruments necessary for the exercise of the powers of the region, provided, however, that any contract for the purchase of electric power supplies, distribution, transmission or metering, billing and information services or related to any of the foregoing, shall not impose direct or individual financial obligations on any Member until approved by such individual Member, as the case may be;

c) make, amend and repeal policies and procedures relative to the operation of the region in accordance with the Joint Powers Statute and other limitations as may be applicable under state law;

d) receive and expend funds, including funds derived from the state mandated system benefit charges and to use such funds in accordance with state law;

e) apply for and receive grants from the commonwealth, the federal government and other public and private grantors;

f) submit an annual report to each Member, which shall contain a detailed audited financial statement and a statement showing the method by which the annual charges assessed against each governmental unit (if any) were computed;

g) borrow money, enter into long or short-term loan agreements or mortgages and apply for state, federal or corporate grants or contracts to obtain funds necessary to carry out the purposes of the Cape Light Compact JPE, provided, however, that such borrowing, loans or mortgages shall be consistent with this Agreement, standard lending practices and G.L. c. 44, §§16-28;

h) subject to G.L. c. 30B (or other applicable procurement laws), enter into contracts for the purchase of supplies, materials and services and for the purchase or lease of land, buildings and equipment, as considered necessary by the Governing Board;

i) as a public employer, to hire staff;

j) to plan projects;

k) to implement projects and/or conduct research;

l) adopt an annual budget and to direct the expenditure of funds made available to the Cape Light Compact JPE by grant or contribution from public and private sector entities, or on account of any contract negotiated or administered by the Cape Light Compact JPE;

m) to acquire property by gift, purchase or lease;

n) to construct equipment and facilities;

o) to apply for and receive contributions and other such financial assistance from public and private sector entities or to receive amounts derived as a portion of the savings on, or as a surcharge, dedicated mills/kilowatt hour fee or other such charge as part of any electric energy purchase or similar contract negotiated and/or administered by the Cape Light Compact JPE and, to the extent required herein, agreed to by each Member to be financially bound thereby;

p) to engage consultants, attorneys, technical advisors and independent contractors;

q) to adopt bylaws to govern its internal affairs;

r) to reimburse persons who have advanced funds;

s) to enforce agreements or otherwise prosecute claims on behalf of Members and coordinate their defense in any claim made against them relating to any agreement or other matter related to the Cape Light Compact JPE;

t) to invest funds;

u) to procure insurance;

v) to obtain project-related financing through any mechanism such as the federal Clean Renewable Energy Bond program or similar or successor programs, and other financing options;

w) to contract with an agent, including, without limitation, a regional government or a Member, to manage or accomplish any of its functions or objectives;

x) to enter into agreements with state, quasi-state, county and municipal agencies, cooperatives, investor-owned utilities and other private entities, all as is convenient or necessary to manage or accomplish any of the Cape Light Compact JPE's functions or objectives; and

y) any such other powers as are necessary to properly carry out its powers as a body politic and corporate.

ARTICLE IV: SERVICES; ACTIVITIES; UNDERTAKINGS

The services, activities or undertakings to be jointly performed within the region are as follows: (i) power supply procurement; (ii) offering of energy efficiency programs; (iii) participation in regulatory and legislative proceedings; (iv) education of the public and government regarding energy issues; and (v) such other services, activities, and undertakings as set forth in Article II (Goals, Policies; Purposes).

ARTICLE V: GOVERNING BOARD

A. Powers of the Governing Board.

In accordance with the Joint Powers Statute, the Cape Light Compact JPE shall be governed by a board of directors consisting of the Directors from the Municipal Members (the "Governing Board"). The Governing Board shall be responsible for the general management and supervision of the business and affairs of the Cape Light Compact JPE, except with respect to those powers reserved to the Members by law or this Agreement. The Governing Board shall coordinate the activities of the Cape Light Compact JPE and may establish any policies and procedures necessary to do so. The Governing Board may from time to time, to the extent permitted by law, delegate any of its powers to committees, subject to such limitations as the Governing Board may impose. The Governing Board may delegate to the Executive Committee (as set forth below in Article V(C) (Executive Committee) the powers to act for the Governing Board between regular or special meetings of the Governing Board. The Governing Board may designate persons or groups of persons as sponsors, benefactors, contributors, advisors or friends of the Cape Light Compact JPE or such other title as they may deem appropriate and as is consistent with applicable law.

The Governing Board shall establish and manage a fund or funds to which all monies contributed by the Members, and all grants and gifts from the federal or state government or any other source shall be deposited.

The Governing Board may borrow money, enter into long or short-term loan agreements or mortgages and apply for state, federal or corporate grants or contracts to obtain funds necessary to carry out the purposes of the Cape Light Compact JPE. The borrowing, loans or mortgages shall be consistent with this Agreement, standard lending practices and G.L. c. 44, §§ 16-28. The Governing Board may, subject to G.L. c. 30B (or other applicable procurement laws), enter into contracts for the purchase of supplies, materials and services and for the purchase or lease of land, buildings and equipment, as considered necessary by the Governing Board.

B. Number, Qualifications and Term of Office.

The Governing Board shall consist of one Director for each Municipal Member. In the absence of a Director, his or her alternate shall be entitled to vote and otherwise exercise all of the powers of such Director. The Directors, and alternate directors, shall be selected by each Municipal Member in accordance with its municipal appointment rules and procedures and for such term as may be established by their respective appointing authorities. Except as hereinafter provided, the Directors (and alternates) shall hold office until the next selection of Directors (and alternates) by each such Member and until his or her successor is selected. Directors shall be subject to any limitations or direction established by their appointing authorities. The Cape Light Compact JPE shall not be responsible for interpreting or enforcing any such limitations that may be established by the appointing authorities. Further, any action on the part of the Cape Light Compact JPE shall not be rendered void or invalid as a result of a Director's failure to abide by any such limitations. The sole remedy of an appointing authority in such instance is to remove and replace such Director.

Each County Member may appoint a representative to attend Governing Board meetings (the "County Representative"). County Representatives may participate in Governing Board discussions and nonbinding Governing Board votes.

C. Executive Committee.

At such time as there are more than five (5) Municipal Members, there shall be an Executive Committee composed of no less than five (5) Directors elected by the Governing Board from among the Directors appointed by the Municipal Members. The Executive Committee shall be selected by majority vote of all of the Directors of the Municipal Members. In addition to the delegation of powers set forth in Article V(A) (Powers of Governing Board), the powers of the ~~Board of Directors~~ Governing Board shall be delegated to the Executive Committee in the following circumstances: (i) when a quorum of the full Governing Board is not present for a regularly scheduled meeting; and (ii) exigent circumstances require Governing Board action, and there is insufficient time to convene a regular meeting of the Governing Board.

The Executive Committee shall conduct its business so far as possible in the same manner as is provided by this Agreement by the Governing Board. A majority of the Executive Committee shall constitute a quorum. The Executive Committee shall keep records of its meetings in form and substance as may be directed by the Governing Board and in accordance with the Open Meeting Law, G.L. c. 30A, §§18-25, and other applicable law.

Any Director who is not a member of the Executive Committee may attend and participate in Executive Committee meetings, but may not vote. Attendance may be in-person or by telephone.

From time to time upon request and at each meeting of the Governing Board ~~of Directors~~, the Executive Committee shall make a full report of its actions and activities since the last meeting of the Governing Board.

If two (2) members of the Executive Committee object to the affirmative action taken by

the Executive Committee, they may appeal such decision within forty-eight (48) hours of such action or vote by requesting a special meeting of the Governing Board in accordance with Article VI(C) (Special Meetings) which must occur as soon as possible but no later fourteen (14) days after the Executive Committee action if the original Executive Committee action was necessitated by exigent circumstances. At such special meeting, the Governing Board may overturn the action or vote of the Executive Committee by a two-thirds vote of the Directors. A vote by the Executive Committee to take no action cannot be appealed.

D. Manner of Acting and Quorum.

The Governing Board shall act by vote of a majority of the Directors of the Municipal Members present and voting at the time of the vote. Unless altered by the Governing Board in accordance with this Agreement, each Municipal Member shall be entitled to select one (1) Director whose vote shall be equal in weight to the Director of any other Municipal Member, except as expressly set forth in the succeeding paragraphs. Directors may participate in meetings remotely in accordance with the regulations of the Office of the Attorney General governing remote participation, 940 C.M.R. 29.10. In accordance with 940 C.M.R. 29.10 and the Open Meeting Law, G.L. c. 30A, §§18-25, a simple majority of the Directors of the Municipal Members must be physically present to attain a quorum. County Representatives shall not count towards a quorum as they have limited participation rights. Directors abstaining from voting shall be counted for meeting quorum purposes, but their votes shall not count with respect to the matters they abstain from voting on. By way of example, if ten (10) Directors from the Municipal Members are present and four (4) abstain from voting, and the remaining Directors split their votes four (4) in favor, two (2) against, the motion would pass.

While a quorum is present, unless another provision is made by law, this Agreement or by the Cape Light Compact JPE's own rules, all business shall be determined by a majority vote of the Directors of the Municipal Members then present and voting. Notwithstanding the foregoing, any vote involving a matter concerning issues which would or could bear in a direct and material fashion on the financial interests of the Municipal Members shall be taken by a weighted vote in which the vote of each Director shall be weighted in the same proportion as the population of the Municipal Member such Director represents bears to the whole population of the Municipal Members of the Cape Light Compact JPE, such population as determined, in the case of Barnstable County, by the most recent federal census, or decennial census, and, in the case of Dukes County, by the most recent data available from the Martha's Vineyard Commission. In case of a dispute as to whether a vote shall be taken on a weighted basis as set forth in this paragraph or on a one (1) town, one (1) vote basis as set forth in the preceding paragraph of this subsection, the determination shall be made by weighted vote as set forth herein. Exhibit B sets forth the population for each Municipal Member, and provides an example of a vote taken in accordance with weighted voting procedures.

E. Rules and Minutes; Meeting Announcements.

The Governing Board shall determine its own rules and order of business, unless otherwise provided by law or this Agreement. The Governing Board shall also provide for the

keeping of minutes of its proceedings in accordance with the Open Meeting Law. All regular and Executive Committee meeting announcements shall be sent to all Directors and County Representatives.

F. Voting.

If requested by any Director and as may be required by law, a vote of the body shall be taken by a roll call and the vote of each Director shall be recorded in the minutes, provided, however, if any vote is unanimous only that fact need be recorded. Pursuant to the Open Meeting Law, roll call votes are required for the following: (i) a vote to go into executive session; (ii) votes taken in executive session; and (iii) votes taken in open session when one or more Directors is participating remotely.

G. Resignation and Removal.

1. Resignation.

Any Director or County Representatives (or their alternates) may resign at any time upon written notice to the remaining Governing Board. A Director may resign from the Executive Committee and still keep his or her position as a Director. The resignation of any Director (or alternate) or resignation from the Executive Committee shall take effect upon receipt of notice thereof or at such later time as shall be specified in such notice, and unless otherwise specified therein, the acceptance of such resignation shall not be necessary to make it effective.

2. Removal.

Any Director (or alternate) may be removed at any time with or without cause by his or her appointing authority. The Governing Board may send a notice to an appointing authority requesting removal of a Director for cause as specified in such notice. For cause removal shall include, but not be limited to, disclosure of documents exempt from disclosure under the Massachusetts Public Records Law in violation of G.L. c. 268A, §23(c)(2), or disclosure of matters discussed during executive session prior to release of executive session minutes.

A Director from a Municipal Member who fails to attend at least half of the Directors' meetings annually shall be automatically removed, unless such Director has requested an exemption from this requirement due to special circumstances (i.e., prolonged illness, conflicting work/personal commitments). Annual attendance shall be calculated on a calendar year basis. The secretary (or other officer of as may be designated by the Governing Board) shall report on the annual attendance of Directors as requested by the Governing Board. In each vote implementing the removal of a Director, the Governing Board shall state an official removal date, which shall generally take place within ninety (90) to one hundred and eighty days (180) in order to give the Municipal Member who appointed such Director an opportunity to replace such Director. A Municipal Member whose Director is removed shall be given immediate notice of such removal. A Director who has been removed or a Municipal Member whose Director has been removed may petition the Governing Board for reinstatement and he or she shall be given

notice and an opportunity to be heard before the Governing Board on such matter within ninety (90) days of such request.

H. Vacancies.

1. Vacancies on the Governing Board.

The remaining Directors may act despite a vacancy in the Governing Board. A vacancy in the Governing Board of a Director from a Municipal Member shall be promptly filled, but in no case more than sixty (60) days thereafter, by the appointing authority of the Municipal Member which originally selected such Director. Each Director chosen to fill a vacancy on the Governing Board shall hold office until his or her successor shall be appointed and qualified by his or her appointing authority. Insofar as there is no Director then in office representing a Municipal Member, the alternate shall act in his or her stead. If a Municipal Member has not appointed an alternate, the Director position shall be considered vacant for that particular Municipal Member and it shall not be counted for quorum purposes under Article V(D) (Manner of Acting and Quorum) or for the purposes of the Open Meeting Law until the Municipal Member fills the vacancy and/or appoints an alternate.

2. Vacancies on the Executive Committee.

Vacancies on the Executive Committee shall be filled in the same manner as the position was originally filled.

3. No Right to Compensation.

No Director shall receive an additional salary or stipend for his or her service as a Governing Board member. Directors are not eligible for health insurance or other benefits provided to employees of the Cape Light Compact JPE.

ARTICLE VI: MEETINGS OF THE GOVERNING BOARD

A. Place.

Meetings of the Governing Board, including meetings of the Executive Committee, shall be held at such place within Barnstable County or Dukes County, or at such other place as may be named in the notice of such meeting.

B. Regular Meetings.

Regular meetings may be held at such times as the Governing Board may fix but no less frequently than quarterly.

C. Special Meetings.

Special meetings of the Governing Board may be called by the chairman or any other officer or Director at other times throughout the year.

D. Notice.

In addition to the personal notice to Directors and County Representatives set forth in Article V(E) (Rules and Minutes; Meeting Announcements), public notice of any regular meeting shall be made in compliance with the Open Meeting Law and other applicable law. Forty-eight (48) hours' notice to Directors and County Representatives by mail, electronic mail, telegraph, telephone or word of mouth shall be given for a special meeting unless shorter notice is adequate under the circumstances, provided, however, that public notice of such special meeting has been made in compliance with applicable law. A notice or waiver of notice need not specify the purpose of any special meeting. Personal notice of a meeting need not be given to any Director or County Representative if a written waiver of notice, executed by him or her before or after the meeting, is filed with the records of the meeting, or to any Director or County Representative who attends the meeting without protesting prior thereto or at its commencement the lack of notice to him or her.

E. Vote of Interested Directors.

A Director or County Representative who is a member, stockholder, trustee, director, officer or employee of any firm, corporation or association with which the Cape Light Compact JPE contemplates contracting or transacting business shall disclose his or her relationship or interest to Governing Board. No Director or County Representative so interested shall deliberate or vote on such contract or transaction. The affirmative vote of a majority of the disinterested Directors or County Representative present and voting hereof shall be required before the Cape Light Compact JPE may enter into such contract or transaction.

In case the Cape Light Compact JPE enters into a contract or transacts business with any firm, corporation or association of which one or more of its Directors is a member, stockholder, trustee, director, officer, or employee, such contract or transaction shall not be invalidated or in any way affected by the fact that such Director or County Representative have or may have interests therein which are or might be adverse to the interests of the Cape Light Compact JPE. No Director or County Representative having disclosed such adverse interest shall be liable to the Cape Light Compact JPE or to any creditor of the Cape Light Compact JPE or to any other person for any loss incurred by it under or by reason of any such contract or transaction, nor shall any such Director or County Representative be accountable for any gains or profits to be realized thereon.

Nothing contained herein shall affect the compliance of any Director or County Representative or the Governing Board or the Cape Light Compact JPE with G.L. c. 268A, as set forth in Article VIII (G.L. c. 268A), below.

ARTICLE VII: OPEN MEETING LAW; EXECUTIVE SESSIONS

The meetings of the Governing Board are subject to the Massachusetts law governing open meetings of governmental bodies and governmental boards and commissions, including the Open Meeting Law. The Governing Board is therefore required to maintain accurate records of its meetings, setting forth the date, time, place, Directors present or absent and action taken at each meeting, including executive sessions.

In accordance with the Open Meeting Law, the Governing Board may hold an executive session after an open meeting has been convened and a recorded roll call vote has been taken to hold an executive session. Executive sessions may be held only for the purposes specifically enumerated in the Open Meeting Law, including, but not limited to, to discuss energy-related trade secrets or confidential information, or litigation strategy.

Matters discussed in executive sessions of the Governing Board must be treated as confidential, and disclosure of such matters is a violation of G.L. c. 268A, §23(c)(2). A violation of confidentiality may lead to disciplinary action as established by the Governing Board, including a request for removal of a Director in accordance with Article V(G)(2) (Removal).

ARTICLE VIII: G.L. c. 268A

Directors, County Representatives, officers and employees of the Cape Light Compact JPE are subject to the provisions of the Massachusetts Conflict of Interest Law, G.L. c. 268A, and shall act at all times in conformity therewith. Public employees who work for two (2) or more public entities may find that each agency has an interest in a particular matter. Any employee, officer, County Representative or Director may request free legal advice from the State Ethics Commission about how the Conflict of Interest Law applies to them in a particular situation. This process is explained at http://www.mass.gov/ethics/commission-services/request-advice.html. Directors may also request a formal conflict of interest opinion from town counsel pursuant to G.L. c. 268A, §22.

In accordance with G.L. c. 268A, §23(c)(2), Directors, County Representatives, officers and employees of the JPE are prohibited from improperly disclosing materials or data that are exempt from disclosure under the Public Records Law, and were acquired by him or her in the course of his or her official duties, and may not use such information to further his or her personal interest.

ARTICLE IX: OFFICERS; STAFF; SERVICE PROVIDERS

A. Election.

At its first meeting of the calendar year, the Governing Board shall elect a chairman, vice chairman, treasurer, secretary and business officer and such other officers as the Governing Board shall determine. The term of office for those so elected shall be one (1) year and until their respective successors are elected and qualified. Other than the treasurer and business officer, all officers must be a Director and, upon selection of a successor Director by such officer's appointing Member, such officer shall immediately tender notice thereof to the Cape

Light Compact JPE and the Governing Board shall select a replacement among the various Directors from the Municipal Members for the remaining term of such officer.

B. Qualifications.

Two (2) or more offices may be held by the same person, except the offices of chairman, secretary or treasurer.

C. Vacancies.

Any vacancy occurring among the officers, however caused, may be filled by the Directors from the Municipal Members for the unexpired portion of the term.

D. Removal and Resignation of Officers.

1. Removal.

Any officer of the Cape Light Compact JPE may be removed from his or her respective offices with or without cause by resolution adopted by a majority of the Directors present and voting at any regular or special meeting of the Governing Board.

2. Resignation.

Any officer may resign at any time by giving his or her resignation in writing to the chairman, treasurer, secretary, the Cape Light Compact JPE Administrator, or Director of the Cape Light Compact JPE. An officer may resign as officer without resigning from other positions in the Cape Light Compact JPE, including positions on the Executive Committee or as Director.

E. Sponsors, Benefactors, Contributors, Advisors, Friends of the Cape Light Compact JPE.

Persons or groups of persons designated by the Governing Board as sponsors, benefactors, contributors, advisors or friends of the Cape Light Compact JPE or such other title as the Governing Board deems appropriate shall, except as the Governing Board shall otherwise determine, serve in an honorary capacity. In such capacity they shall have no right to notice of or to vote at any meeting, shall not be considered for purposes of establishing a quorum and shall have no other rights or responsibilities.

F. Chairman.

The chairman shall preside at all meetings at which he or she is present. Unless otherwise directed by the Governing Board, all other officers shall be subject to the authority and supervision of the chairman. The chairman also shall have such other powers and duties as customarily belong to the office of chairman or as may be designated from time to time by the

Governing Board.

G. Vice Chairman.

The vice chairman shall assist the chairman and preside at meetings at which the chairman is not present. The vice chairman also shall have such other powers and duties as customarily belong to the office of vice chairman or as may be designated from time to time by the Governing Board.

H. Treasurer and Business Officer.

The Governing Board shall appoint a treasurer who may be a treasurer of one of the Municipal Members. No Director or other employee of the Cape Light Compact JPE shall be eligible to serve concurrently as treasurer. The treasurer, subject to the direction and approval of the Governing Board, shall be authorized to receive, invest and disburse all funds of the Cape Light Compact JPE without further appropriation. The treasurer shall give bond for the faithful performance of his or her duties in a form and amount as fixed by the Governing Board. The treasurer may make appropriate investments of the funds of the Cape Light Compact JPE consistent with G.L. c. 44, §55B.

The Governing Board shall appoint a business officer who may be a city auditor, town accountant or officer with similar duties, of one of the Municipal Members. The business officer shall have the duties and responsibilities of an auditor or accountant pursuant to G.L. c. 41, §§52 and 56 and shall not be eligible to hold the office of treasurer.

If the Cape Light Compact JPE is using a service provider pursuant to Article IX(M) (Service Providers) to handle Cape Light Compact JPE funds, the Governing Board shall consider using one or more employees of such service provider to serve as treasurer or business officer.

I. Secretary.

The secretary shall arrange for the recording, consistent with applicable law, of all proceedings of the Governing Board, Executive Committee and any other such committee in a book or books to be kept therefor, and have such powers and duties as customarily belong to the office of clerk or secretary or as may be designated from time to time by the chairman or the Governing Board.

J. Other Officers.

The Governing Board shall retain legal counsel for the Cape Light Compact JPE. The Cape Light Compact JPE's legal counsel may jointly represent the Cape Light Compact JPE's Municipal Members or other parties in accordance with this Article XIX(I) (Shared Legal Representation) of this Agreement.

The Cape Light Compact JPE shall designate a Chief Procurement Officer, whose role, in accordance with G.L. c. 30B (or other applicable procurement laws) and other applicable provisions of law, shall be to select proposals for and facilitate the award of contracts on behalf of the Cape Light Compact JPE, with input from Directors, the Cape Light Compact JPE staff, counsel and others, as such Chief Procurement Officer sees fit. Notwithstanding the foregoing, the Governing Board may determine that the Cape Light Compact JPE, as long as consistent with applicable law, will select proposals and award contracts in another manner.

Other officers shall have such powers as may be designated from time to time by the Governing Board.

K. The Cape Light Compact JPE Administrator.

The Governing Board shall appoint a JPE Administrator who shall be an employee of the Cape Light Compact JPE. In general, the Cape Light Compact JPE Administrator shall serve as the chief administrative and operating officer and supervise, direct and be responsible for the efficient administration of the business of the Cape Light Compact JPE.

More specifically, the Cape Light Compact JPE Administrator shall be responsible for:

(i) Implementing the goals and carrying out the policies of the Cape Light Compact JPE Governing Board;

(ii) Maintaining the complete and full records, reports and filings associated with the financial and administrative activity of the Cape Light Compact JPE;

(iii) Planning and directing all administrative and operational functions of the Cape Light Compact JPE consistent with budgets approved by the Governing Board;

(iv) Managing the hiring process, supervising and directing the work of all staff consistent with budgets and strategic goals approved by the Governing Board;

(v) Consulting and advising the Governing Board as to the business, operational and strategic concerns of the Cape Light Compact JPE including fiscal affairs, legal and operational issues, and major program initiatives;

(vi) Regularly attending all Governing Board meetings and answering all questions addressed to him or her;

(vii) Managing the Cape Light Compact JPE's legal affairs, including directing the Cape Light Compact JPE's participation in regulatory and judicial proceedings, consistent with relevant budgets approved by the Governing Board;

(viii) Managing the Cape Light Compact JPE's energy efficiency program in accordance with all applicable laws and the rules and regulations of the DPU, or any successor entity;

(ix) Negotiating and executing contracts for power supply procurement, renewable energy certificates, energy efficiency contracts, contracts for professional services and legal services in order to achieve the strategic goals and business purposes of the governing board; and

(x) Perform such other duties as may be directed by the Governing Board from time to time, or as may be necessary or advisable to fulfill the Cape Light Compact JPE's objectives.

The Governing Board may elect to expand, limit or otherwise amend the foregoing responsibilities by replacing this Article IX(K) with a list of responsibilities set forth in Exhibit C.

L. Cape Light Compact JPE Staff.

The Cape Light Compact JPE shall be a public employer. The Governing Board may employ personnel to carry out the purposes of this Agreement and establish the duties, compensation and other terms and conditions of employment of personnel. The Governing Board shall take all necessary steps to provide for continuation of membership in a valid and existing public employee retirement system.

M. Service Providers.

The Governing Board may appoint or engage one or more service providers to serve as the Cape Light Compact JPE's administrative, fiscal or operational agent in accordance with the provisions of a written agreement between the Cape Light Compact JPE and the service provider. A Municipal Member may contract with the Cape Light Compact JPE to be a service provider. The service provider agreement shall set forth the terms and conditions by which the service provider shall perform or cause to be performed the requested services. This subsection (M) shall not in any way be construed to limit the discretion of the Cape Light Compact JPE to hire its own employees to perform such functions.

ARTICLE X: BUDGET; FINANCING; BORROWING; AND RELATED MATTERS

A. Budget; Segregation of Funds; Expenditures.

Prior to the beginning of each fiscal year, the Cape Light Compact JPE staff shall work with the Governing Board to prepare a proposed operating budget. The Cape Light Compact JPE shall adopt an operating budget for each fiscal year and direct the expenditure of funds in accordance with applicable law. The operating budget and any amendments thereto shall be approved by a weighted vote of the Governing Board in accordance with Article V(D) (Manner

of Acting and Quorum).

All funds of the Cape Light Compact JPE shall be held in separate accounts in the name of the Cape Light Compact JPE and not commingled with funds of any other person or entity. All funds of the Cape Light Compact JPE shall be strictly and separately accounted for, and regular reports shall be rendered of all receipts and disbursements. The Governing Board shall contract with a certified public accountant to make an annual audit of the accounts and records of the Cape Light Compact JPE. All expenditures shall be made in accordance with the approved budget and in accordance with any applicable procedures or controls as may be authorized by the Governing Board.

B. Financing.

The Cape Light Compact JPE shall finance the joint services, activities or undertakings within the region in the manner set forth in this Article X. Upon the transfer of operations as set forth in Article XVIII(C) (Transfer of Operations), the Cape Light Compact JPE may collect a kilowatt hour charge or equivalent of up to a mil per kilowatt hour, from consumers participating in the municipal aggregation power supply program. The amount collected may be up to 1 mil ($.001), or such lower amount as the Cape Light Compact JPE Administrator may determine, for every kilowatt hour sold to consumers for the duration of service under a competitive electric supply agreement (this charge is referred to as an "Operational Adder"). The Cape Light Compact JPE will primarily use the Operational Adder funds to support the municipal aggregation power supply program budget and other costs associated with implementing the powers and purposes of the Cape Light Compact JPE. The level of the Operational Adder shall be determined during the annual operating budget process based upon the projected expenses of the Cape Light Compact JPE. All uses of the Operational Adder shall follow the Cape Light Compact JPE budget appropriation process.

Upon the transfer of operations as set forth in Article XVIII(C) (Transfer of Operations), funding for the Cape Light Compact JPE's energy efficiency activities shall come in part from the mandatory system benefits charges imposed on consumers in accordance with G.L. c. 25, §19(a), which funds energy efficiency programs administered by municipal aggregators with energy plans certified by the DPU under G.L. c. 164, §134(b). In addition, in accordance with G.L. c. 25, §19(a), the Cape Light Compact JPE's energy efficiency activities may also be funded by revenues from the forward capacity market administered by ISO New England Inc., revenues from cap and trade pollution control programs (e.g., Regional Greenhouse Gas Initiative), other funding sources and an energy efficiency surcharge, as approved by the DPU or a successor thereto. In addition, the Cape Light Compact JPE shall finance the joint services, activities or undertakings within the region with grants from the commonwealth, the federal government and other public and private grantors;

C. Borrowing.

The Cape Light Compact JPE is authorized to incur borrowing pursuant to the Joint Powers Statute. There are no limitations on the purposes, terms and amounts of debt the Cape

Light Compact JPE may incur to perform such services, activities or undertakings, except as may established by law.

ARTICLE XI: COOPERATION; AUTHORITY DOCUMENTS

The Members agree to act in good faith and use their best efforts to effectuate the intent and purpose of this Agreement. All parties to this Agreement shall cooperate to the fullest extent possible.

The Members acknowledge and agree that the authority of the Cape Light Compact JPE will be evidenced and effectuated through this Agreement and through Governing Board votes, resolutions and various documents duly adopted by the Governing Board. The Members agree to abide by and comply with the terms and conditions of all such votes, resolutions and documents that may be adopted by the Governing Board, subject to ~~the Members'~~ each Member's right to withdraw from the Cape Light Compact JPE as described in Article XVI (Term; Termination; Withdrawal).

ARTICLE XII: ELECTRICITY AND OTHER AGREEMENTS

Pursuant to this Agreement, the Members and private consumers may enter into contracts for the distribution, transmission and/or supply of electricity, for the purchase of energy and RECs, and for project financing in support thereof, provided, however, that any contract for the purchase of electric power supplies, distribution, transmission or metering, billing and information services or related to any of the foregoing, shall not impose direct or individual financial obligations on any Members until approved by such individual Member, as the case may be, and further, that any contract shall indemnify and hold harmless the Cape Light Compact JPE and its Members from any financial liability or provide commercially reasonable indemnification with respect to the provision of such products or services.

ARTICLE XIII: OTHER APPLICABLE LAWS

Nothing in this Agreement or in any negotiated contract for the supply of electricity shall be construed to supersede, alter or otherwise impair any obligation imposed on any Member by otherwise applicable law.

ARTICLE XIV: INDEMNIFICATION OF DIRECTORS; LIABILITY OF DIRECTOR AND OFFICERS; INSURANCE; INDEMNIFICATION OF MEMBERS

A. Indemnification of Directors.

The Cape Light Compact JPE shall, to the extent legally permissible, indemnify the Directors, County Representatives, officers and Members. All contracts negotiated or undertaken by the Cape Light Compact JPE shall also include, to the maximum extent feasible, indemnification of the Directors, County Representatives, officers and the Members.

B. Liability of Directors, Officers, and Employees.

The Directors, County Representative, officers, and employees of the Cape Light Compact JPE shall use ordinary care and reasonable diligence in the exercise of their powers and in the performance of their duties pursuant to this Agreement. No current or former Director, officer, or employee will be responsible for any act or omission by another Director, County Representative, officer, or employee.

C. Insurance.

The Cape Light Compact JPE shall acquire such insurance coverage as the Governing Board deems necessary to protect the interests of the Cape Light Compact JPE, the Members, the Directors and officers, employees and the public. If possible, such insurance coverage shall name the Members as additional insureds. If the Cape Light Compact JPE has employees, it shall obtain worker's compensation insurance.

D. Indemnification of Members.

The Cape Light Compact JPE shall defend, indemnify and hold harmless the Members from any and all claims, losses, damages, costs, injuries and liabilities of every kind to the extent arising directly or indirectly from the conduct, activities, operations, acts, and omissions of the Cape Light Compact JPE under this Agreement, and not arising directly or indirectly from the negligent or intentional actions of any Member. In addition, the Cape Light Compact JPE shall not be responsible for indemnifying any Member for any claims, losses, damages, costs or injuries arising from any duties that such Member has agreed to assume in a contract with the Cape Light Compact JPE.

ARTICLE XV: AMENDMENT; REVISION OF EXHIBITS

Except as set forth below in the following paragraph, this Agreement may be altered, amended, or repealed, in whole or in part, by the affirmative vote of Directors of Municipal Members whose population is at least equal to 50% of the combined population of all of the Municipal Members of the Cape Light Compact JPE. Notice of proposed amendments shall be sent to Members at least thirty (30) days before any Governing Board vote on such amendments in accordance with Article XIX(D) (Notices).

Certain amendments to this Agreement and certain actions of the Cape Light Compact JPE shall require the affirmative approval of the Municipal Members whose population is at least equal to 50% of the combined population of all of the Municipal Members of the Cape Light Compact JPE: (i) Article I(B) (Eligibility for Membership; Addition of Members); and (ii) Article I(D) (Liability of Members).

In addition, termination of the Cape Light Compact JPE shall require the approval of all Municipal Members.

The Municipal Members agree that Exhibits A (List of Members), B (Weighted Voting) and C (JPE Administrator Responsibilities) to this Agreement set forth certain administrative matters that may be revised by the Cape Light Compact JPE Administrator in accordance with Governing Board authorization without such revision constituting an amendment to this Agreement. The Cape Light Compact JPE shall provide written notice to the Members of the revision to such exhibits.

ARTICLE XVI: TERM; TERMINATION; WITHDRAWAL

This Agreement shall continue in effect for a term not to exceed twenty-five (25) years. At the conclusion of the term, taking into account any changed circumstances, the Municipal Members shall in good faith negotiate a replacement agreement.

Any Member may voluntarily withdraw from the Cape Light Compact JPE at the end of each calendar quarter upon at least ninety (90) days prior written notice. Withdrawal of such Member shall not affect any obligations entered into prior to the date of withdrawal which are binding by their terms on such member, including, without limitation, contracts directly entered into by such Member and financial contributions to the Cape Light Compact JPE made or agreed to be made by such member.

This Agreement may be terminated by collective agreement of all the Municipal Members; provided, however, the foregoing shall not be construed as limiting the rights of a Municipal Member to withdraw its membership in the Cape Light Compact JPE, and thus terminate this Agreement only with respect to such withdrawing Municipal Member.

Upon termination of this Agreement, any surplus money or assets in possession of the Cape Light Compact JPE for use under this Agreement, after payment of all liabilities, costs, expenses, and charges incurred under this Agreement shall be returned to the then-existing Members in proportion to the contributions made by each, if applicable; if no contributions were made, surplus assets shall be distributed based on the relative populations of each Municipal Member. Payment of liabilities and disbursement of surplus money or assets shall also be in accordance with any rules, regulations and policies adopted by governmental authorities having jurisdiction over the Cape Light Compact JPE.

ARTICLE XVII: CONSTRUCTION AND SEVERABILITY

This Agreement shall be liberally construed so as to effectuate the purposes thereof. The provisions of this Agreement shall be severable and if any phrase, clause, sentence or provision of this Agreement is declared to be contrary to the constitution of the Commonwealth of Massachusetts or of the United States, or the applicability thereof to any government, agency, person or circumstance is held invalid, the validity of the remainder of this Agreement and the applicability thereof to any government, agency, person or circumstance shall not be affected thereby. If this Agreement shall be held contrary to the constitution or the Massachusetts General Laws, the Cape Light Compact JPE shall remain in full force and effect as to all severable matters.

ARTICLE XVIII: THE CAPE LIGHT COMPACT JPE AS SUCCESSOR TO THE COMPACT; TRANSFER OF COMPACT'S ADMINISTRATIVE AND OPERATIONAL FUNCTIONS

A. The Cape Light Compact JPE's Status as Successor Entity to the Compact.

It is the intent of the Members that the Cape Light Compact JPE eventually serve as the successor entity to the Compact.

In order to provide for an orderly transition, the Cape Light Compact JPE and the Compact will coordinate transfer and succession plans in accordance with this Article XVIII.

B. Transfer of Administrative and Financial Functions.

Upon transfer of the Compact's operations as set forth in Article XVIII(D) (Transfer of Operations) below, and in accordance with applicable transfer and succession plans, the Cape Light Compact JPE shall assume all benefits, obligations and liabilities of the Compact.

Upon the Effective Date, the Cape Light Compact JPE will serve as the administrative and fiscal arm of the Compact. As soon as practicable, Compact staff will become employees of the Cape Light Compact JPE. At such time, the Cape Light Compact JPE shall assume responsibility for any and all loss, injury, damage, liability, claim, demand, tort or worker's compensation incidents that occur on or after the date personnel are transferred to the Cape Light Compact JPE. The Cape Light Compact JPE will also perform certain financial services for the Compact as set forth in a written agreement between the Compact and the Cape Light Compact JPE. The Cape Light Compact JPE may elect to delegate performance of such functions to service providers as set forth in Article IX(M) (Service Providers).

B. Transfer of Operations.

Unless such other date is established by the Governing Board, when the majority of the municipal members of the Compact join the Cape Light Compact JPE, the Compact and the Cape Light Compact JPE will develop an asset transfer and succession plan. and, in consultation with DPU (and other governmental authorities if necessary or convenient), will establish an operational transfer date ~~(no later than January 31, 2018, unless otherwise directed by DPU)~~. Once such date is established, the Cape Light Compact JPE will notify the members of the Compact of the deadline for joining the Cape Light Compact JPE in order to participate in its aggregation plan. On or before the operational transfer date, the Cape Light Compact JPE will execute all documents and perform all acts necessary to transfer all programs, operational functions, tangible and intangible assets (including intellectual property), contracts and records of the Compact to the Cape Light Compact JPE so that the Cape Light Compact JPE is the legal successor to the Compact.

C. Meetings and Board Membership During Transition Period.

During the transition period, meetings of the Cape Light Compact JPE will occur immediately before or after scheduled meetings of the Compact. In order to provide for an orderly transition or for any other reason that a Municipal Member deems appropriate, a Municipal Member may appoint the same person to serve on the Cape Light Compact JPE's and Compact's Governing Boards.

E. Completion of Transition and Reorganization

The foregoing subsections (A) – (D) have no future operational effect as of [December 13, 2017] the effective date of this Agreement. They remain in this Agreement as a placeholder and for historical context. The operational transfer date was July 1, 2017[1]. On that date, the Cape Light Compact JPE became the legal and operational successor to the Compact.

[Note to readers: This Article cannot be wiped out entirely. There is a cross-reference to it in Article I which cannot be amended unless the majority of Municipal Members approve.]

ARTICLE XIX: MISCELLANEOUS

A. Principal Office.

The principal office of the Cape Light Compact JPE shall be located at such places as the Governing Board may establish from time to time.

B. The Cape Light Compact JPE Records.

The original, or attested copies, of this Agreement and records of all meetings of the Governing Board shall be kept in Massachusetts at the principal office of the Cape Light Compact JPE. Said copies and records need not all be kept in the same office. They shall be available at all reasonable times for the inspection of any Municipal Member or Director for any proper purpose and as required by law. The records of the Cape Light Compact JPE shall be subject to the Massachusetts Public Records Act, G.L. c. 66, and shall be deemed public records, unless such records fall within the exemptions set forth in G.L. c. 4, §7, including exemptions for development of inter-agency policy and trade secrets or commercial or financial information.

C. Fiscal Year.

The fiscal year of the Cape Light Compact JPE shall begin on January 1st and end on December 31st.

D. Notices.

All notices, waivers, demands, requests, consents or other communications required

[1] On April 12, 2017, the Governing Board voted to establish the operational transfer date as July 1, 2017.

or permitted to be given or made under this Agreement shall be in writing and if addressed to the Cape Light Compact JPE shall be sent to:

JPE Administrator
Cape Light Compact JPE
~~3195 Main Street~~
~~Open Cape Building~~
~~Barnstable, MA 02630~~
261 Whites Path, Unit 4
South Yarmouth, MA 02664

The Cape Light Compact JPE may change its address by sending a notice of change of address to all Members.

Members shall be required to send the Cape Light Compact JPE a notice each January setting forth the name, address and other contact information for its Director and alternate director, and the contact name and address for all notices to be sent to Members under this Agreement. If no address has been provided for notices, the Cape Light Compact JPE may use the Town Clerk's address for a Member as provided on its website.

A Member may change its address by sending a notice of change of address to the Cape Light Compact JPE.

Except for any notice required by law to be given in another manner, all notices, waivers, demands, requests, consents, or other communications required or permitted by this Agreement to be effective shall be in writing, properly addressed, and shall be given by: (i) personal delivery; (ii) established overnight commercial courier delivery service with charges prepaid or duly charged by the sender; or (iii) registered or certified mail, return receipt requested, first class, postage prepaid. Notices given hereunder shall be deemed sufficiently given on: (i) the date of personal delivery if so delivered; (ii) the day after sending if sent by established overnight commercial courier delivery service; or (iii) the fifth day after sending if sent by registered or certified mail. The Cape Light Compact JPE and the Members may additionally provide notice by electronic mail, facsimile, or telephone communication, but this shall not relieve the notifying party of the obligation to provide notice as specified above.

E. Reports.

The Cape Light Compact JPE shall submit an annual report to each Member which shall contain a detailed audited financial statement and a statement in accordance with the Joint Powers Statute.

The Cape Light Compact JPE shall prepare a written annual report, in the format required by the DPU regarding the expenditure of energy efficiency funds for the previous calendar year. Such reports shall be filed with the DPU no later than August 1, unless filing or reporting requirements established by the DPU necessitate a different date, and posted to the Cape Light

Compact JPE's web site within thirty (30) days of submission to the DPU. In addition, the Cape Light Compact JPE shall periodically prepare written overviews of the Cape Light Compact JPE's program activities for each Municipal Member for inclusion in its individual town annual reports.

Upon the transfer of operations as set forth in Article XVIII(C) (Transfer of Operations), for so long as is required by the DPU, the Cape Light Compact JPE shall submit an annual report to the DPU on December 1st of each year regarding its municipal aggregation power supply program. The annual report will, at a minimum, provide: (1) a list of the program's competitive suppliers over the past year; (2) the term of each power supply contract; (3) the aggregation's monthly enrollment statistics by customer class; (4) a brief description of any renewable energy supply options; and (5) a discussion and documentation regarding the implementation of the municipal aggregation's alternative information disclosure strategy. As approved by the DPU, the Cape Light Compact JPE may submit this report on a fiscal year basis.

F. Dispute Resolution.

The Members and the Cape Light Compact JPE shall make reasonable efforts to settle all disputes arising out of or in connection with this Agreement. Before exercising any remedy provided by law, a Member and the Cape Light Compact JPE shall engage in nonbinding mediation in the manner agreed upon by the participating Member and the Cape Light Compact JPE. The Cape Light Compact JPE and Members agree that each Municipal Member may specifically enforce this Article XIX(F). In the event that nonbinding mediation is not initiated or does not result in the settlement of a dispute within sixty (60) days after the demand for mediation or is made, any Municipal Member and the Cape Light Compact JPE may pursue any remedies provided by law.

G. Multiple Originals.

This Agreement shall be executed in accordance with the requirements of the Joint Powers Statute. Amendments to this Agreement requiring approval of Directors shall be executed by the Directors approving such amendments. Amendments to this Agreement requiring approval of the Municipal Members shall be executed in the manner set forth in the Joint Powers Statute.

This Agreement may be executed in several counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. In addition, this Agreement may contain more than one counterpart of the signature page and all of such signature pages shall be read as though one and shall have the same force and effect as though all of the parties had executed a single signature page.

H. No Partnership or Joint Venture in Contracts with Third Parties; Limitation of Responsibility.

In carrying out its purposes as described herein, and in entry into any third party contract

for the purchase of electric power supplies, distribution, transmission or metering, billing and information services or related to any of the foregoing, neither the Cape Light Compact JPE nor any of its Members shall be a partner or joint venturer with any third party. The relationship between the Cape Light Compact JPE (and/or its Members) on the one hand and the other party(ies) to such contract on the other hand shall be that of buyer and seller or agent for the buyer and seller, as the case may be. Nothing therein contained shall be deemed to constitute the Cape Light Compact JPE (and/or its Members) as a partner, agent or legal representative of any third party or to create a joint venture, agency or any relationship between the Cape Light Compact JPE (and/or its Members) and any third party other than that of buyer and seller or agent for the buyer and seller, as the case may be. The Cape Light Compact JPE and its Members have no responsibility to supply, distribute, transmit, meter, bill or otherwise provide electricity to any consumer and none is implied hereby or thereby. Nothing in this Article XIX(H) shall be construed as prohibiting the Cape Light Compact JPE from entering into a partnership or joint venture relationship with any organization in which it has a membership interest or affiliation.

I. Shared Legal Representation Involving Members or Other Public Entities; Official Duties of Cape Light Compact JPE Counsel.

The Cape Light Compact JPE may from time to time to retain counsel who may also represent its Members or other public entities in matters in which the Cape Light Compact JPE has a direct or substantial interest without violating G.L. c. 268A, subject to the consent and approval of all parties requesting legal representation (which may be one or more Members, or one or more non-Member parties). Such dual or common representation allows the Cape Light Compact JPE to pool resources for a common purpose, develop mutual interests, and preserve public funds. The official duties of the Cape Light Compact JPE counsel include, but are not limited to, representing Members or other public entities in: (i) administrative and judicial proceedings in which the Cape Light Compact JPE is also a party; (ii) contract negotiations or project development matters in which the Cape Light Compact JPE or its Members have an interest, and (iii) other matters in which the Cape Light Compact JPE has a direct or substantial interest, provided that in each instance, such dual or common representation would not cause a violation of rules governing attorney conduct. The Cape Light Compact JPE counsel shall discharge such duties only when requested in writing by the Cape Light Compact JPE's Governing Board. Prior to making such a request, the Cape Light Compact JPE's Governing Board shall determine whether the interests of the Cape Light Compact JPE would be advanced by such dual or common representation and shall evaluate if actual or potential conflicts of interest exist. If any conflicts are identified, they shall be described in the written request. Counsel shall then make its own determination whether such dual or common representation would not cause a violation of rules governing attorney conduct. Representation of the Compact and the Cape Light Compact JPE shall not be considered dual representation as the two entities shall function as two component parts of one legal entity for a transition period, and then the Cape Light Compact JPE shall serve as the successor entity to the Compact.

Should the provision in G.L. c. 268A limiting dual or common representation be amended or replaced after the Effective Date, the Governing Board may elect to follow any alternative

procedures with respect to dual or common legal representation as provided by such statute.

[EXECUTION PAGES TO FOLLOW]

LIST OF EXHIBITS

Exhibit A – List of Members
Exhibit B – Weighted Voting
Exhibit C – JPE Administrator Responsibilities

EXHIBIT B

Weighted Voting

Name of Town	Population
Aquinnah	**311**
Barnstable	**45,193**
Bourne	**19,754**
Brewster	**9,820**
Chatham	**6,125**
Chilmark	**866**
Dennis	**14,207**
Eastham	**4,956**
Edgartown	**4,067**
Falmouth	**31,531**
Harwich	**12,243**
Mashpee	**14,006**
Oak Bluffs	**4,527**
Orleans	**5,890**
Provincetown	**2,942**
Sandwich	**20,675**
Tisbury	**3,949**
Truro	**2,003**
Wellfleet	**2,750**
West Tisbury	**2,740**
Yarmouth	**23,793**

For an example of weighted voting, if the Municipal Members consisted of the Towns of Barnstable, Bourne and Brewster, the total population of the three Municipal Members would be 74,767. For weighted voting purposes, Barnstable's vote would be weighted 60.45%, Bourne's vote would be weighted 26.42%, and Brewster's would be weighted 13.13%.

Nauset Estuary Dredging Feasibility Assessment

Prepared For:
Office of the Town Administrator
Town of Orleans
19 School Road
Orleans, MA 02653-3699

Prepared By:
Woods Hole Group &
Anderson Consulting Associates

February 2016

Nauset Estuary Dredging Feasibility Assessment

February 2016

Prepared for:
Town of Orleans
19 School Road
Orleans, MA 02653

Prepared by:
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East Falmouth MA 02536
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David K. Ralston
Anderson Consulting Associates
6 Arrowhead Lane
Marion, MA 02738

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1.0 INTRODUCTION

This report describes a study conducted for the Town of Orleans into the feasibility of developing a dredging program for improved navigation in Nauset Estuary. Significant shoaling has resulted in major changes to the channel and mooring areas, and navigation is typically restricted to several hours on either side of high tide. Commercial fishing boats have been forced to moor in deeper areas of the channel immediately behind the barrier beach, and offload their catch and crew to nearby landings via skiff. This is a less efficient alternative to prior practices, which afforded the fleet the opportunity to moor directly offshore Snow Shore, Priscilla and Goose Hummock landings. These difficulties with navigation and the concerns over public safety prompted the Town of Orleans to commission this study to evaluate a potential dredging program for the estuary.

The Town's conceptual dredge plan focused on portions of Nauset Estuary that provide boat access to the public landings and commercial boating facilities (Figure 1). This includes the main channel starting at the inlet to the Atlantic Ocean and continuing approximately 4.2 miles to Town Cove. The Town Cove area supports public facilities at Goose Hummock, Cove Road, and Asa's Landing, as well as private facilities at Orleans Yacht Club, Nauset Marine, and the Goose Hummock Shop. Areas of the estuary southeast of the main channel providing access to Snow Shore and Priscilla Road Landings were included in the plan. These areas of the estuary are located in the Towns of Orleans and Eastham and a portion of the study area is also located in the Cape Cod National Seashore (Figure 1).

The feasibility of a dredging program will depend on a host of factors including environmental impacts, project lifetime, costs and schedule for permitting, and costs for project construction. The purpose of this study is to develop the necessary information to reliably address these factors. Once this information is known, the Town will be in a position to make an informed decision as to the overall feasibility of the project.

This study takes advantage of existing information and studies, and also leverages the valuable experience of Town officials and other local stakeholders. New data collected as part of this study add to an improved understanding of the Nauset Estuary system, particularly as related to the engineering, environmental, financial, and practical aspects of a dredge program. Section 2.0 provides information on the existing physical and ecological environment in the estuary that influence the dredge and disposal plan formulation described in Section 3.0. The primary factors that determine project feasibility are included in Section 4.0, and recommendations for consideration by the Town if the project is pursued are described in Section 5.0.

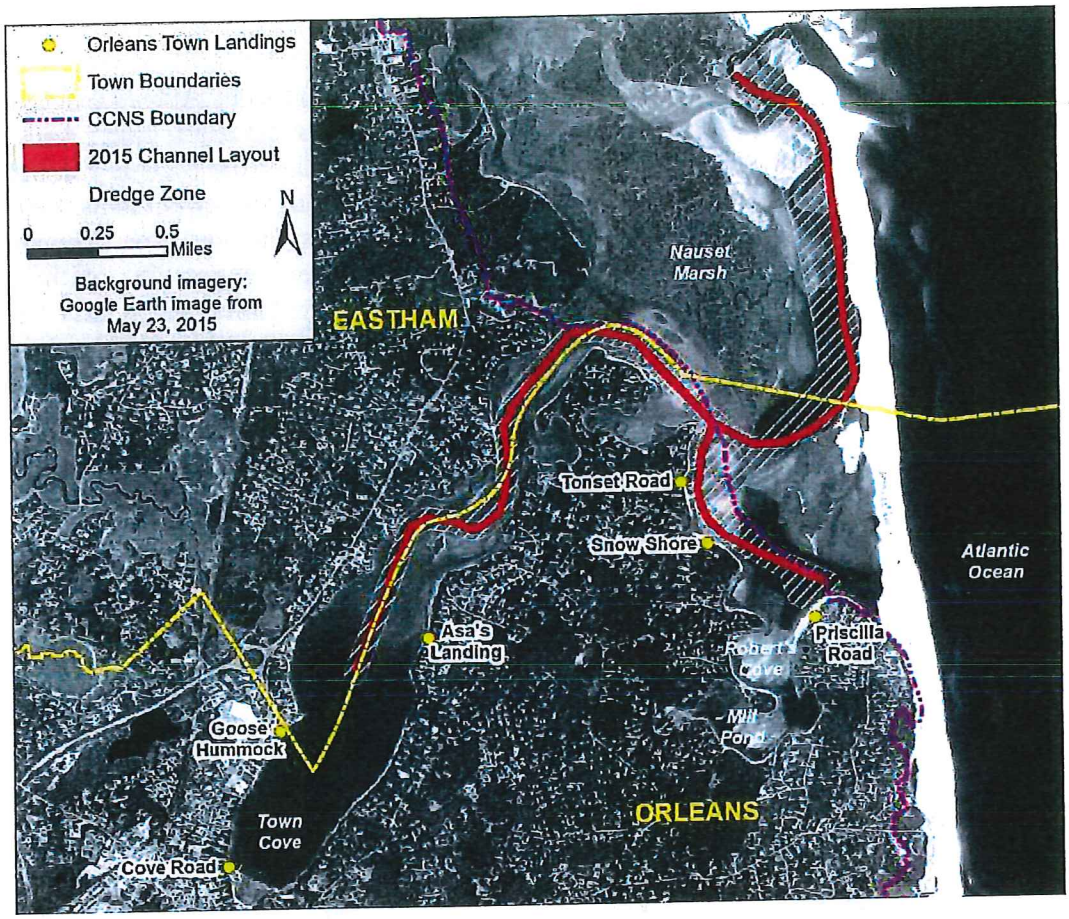

Figure 1. Nauset Estuary showing layout of conceptual dredge plan.

2.0 EXISTING ENVIRONMENT

An understanding of the existing environment in Nauset Estuary is critical to evaluating the feasibility of a dredging program. Data describing the quantity and type of sediment that will need to be dredged given current bathymetric and shoal conditions will control placement alternatives, construction methods, and also construction costs. A fundamental understanding of the changes in geomorphology of the barrier beach and Nauset Estuary inlet and the hydrodynamics of the system will provide valuable insight into areas of the channel that tend to shoal the fastest and will require frequent maintenance dredging. Information on ecological factors such as red tide cysts, shellfish, eelgrass, and other sensitive resources will help to identify potential environmental constraints on a dredging program.

For the purposes of this study the existing conditions of Nauset Estuary were documented through review of available information and limited collection and analysis of new data. The existing physical and ecological conditions of the estuary are described in the following report sections. Data sources are included and where new data were collected, the field and data analysis methods are described.

2.1 GEOMORPHOLOGY

This history of geomorphologic changes at Nauset Inlet was studied by Aubrey and Speer (1984) and more recently by Woods Hole Group (2006). Historical charts dating back to 1779 and aerial photography from 1938 and 1946, show the inlet to be located just north of Nauset Heights at the southeastern edge of the estuary. During the approximate 170-yr period that the inlet was located in the vicinity of Nauset Heights, spit formation extending to the north from the lower beach was non-existent (Figure 2). Although Aubrey and Speer (1984) agree that aperiodic coverage of historical maps may have undersampled previous episodes of inlet migration, they suggest that the persistence of a southern location suggests a historically stable inlet configuration at Nauset Heights.

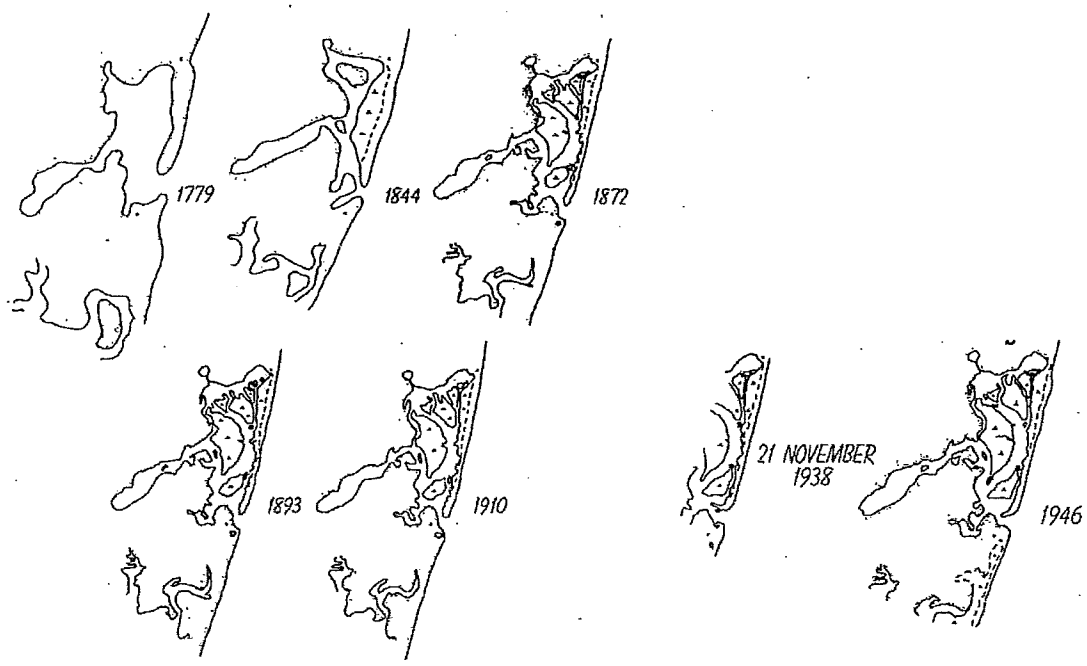

Figure 2. Representative charts and historical aerials from 1779 to 1946 showing stability of the Nauset Estuary inlet at Nauset Heights (Aubrey and Speer, 1984).

Inlet activity at Nauset Harbor has been distinctly more active during the last 70 years. Starting in the 1950s, the inlet experienced two distinct cycles of northward migration. During the first phase between 1950 and 1957, the length of the northern spit extending from Coast Guard Beach remained relatively stable, while the southern spit extending from Nauset Heights continually grew northward. A series of storms in the late 1950s and early 1960s re-established the inlet to its southernmost position immediately adjacent to Nauset Heights. The second cycle began in 1965 and lasted approximately 25 years until 1990. This period of northerly inlet migration was characterized by substantial

erosion of the north spit along with northward growth and extension of the south spit (Figure 3). The distance of northerly inlet migration during this period was about 1.3 miles.

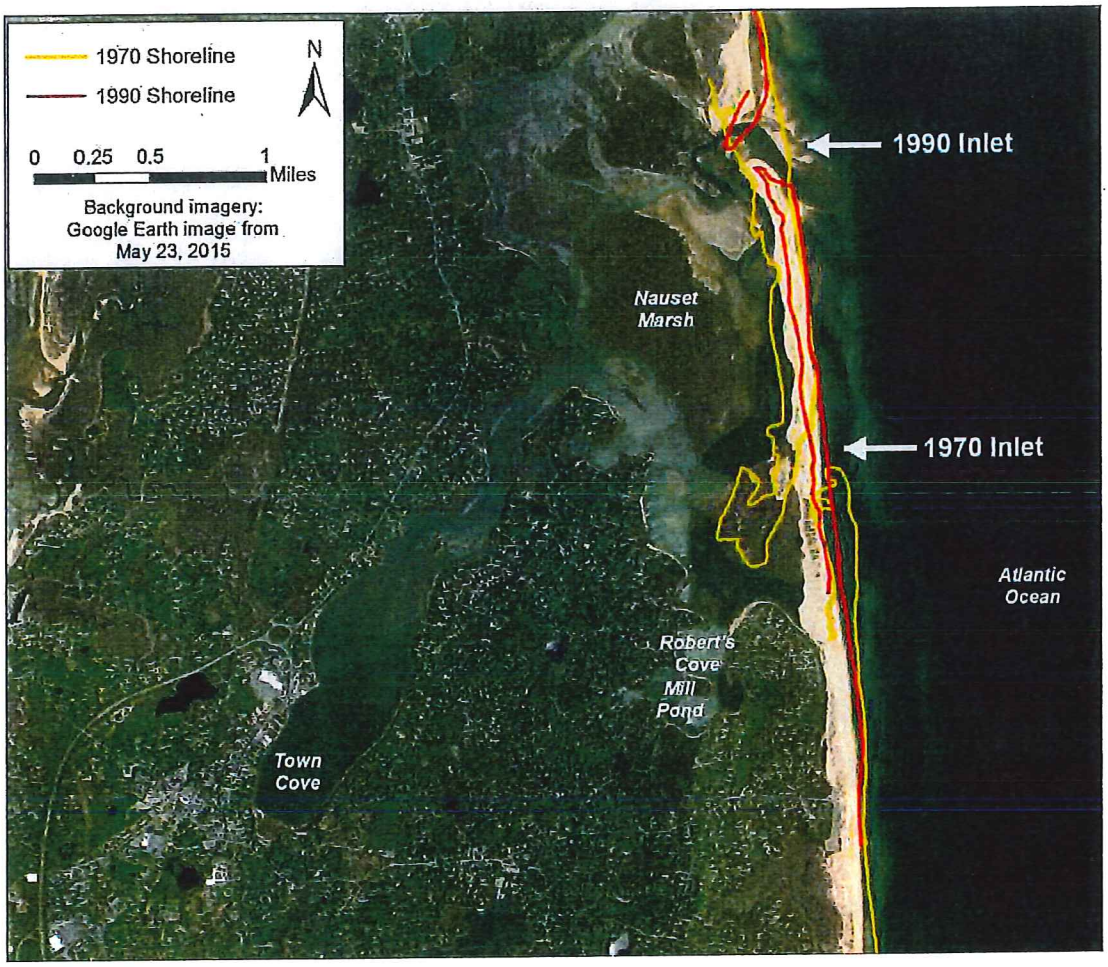

Figure 3. Northerly migration of Nauset Estuary inlet between 1970 and 1990.

Storm activity in the early 1990s caused a breach in the barrier beach near the north end of Tern Island. The system supported two inlets for a period of 2 to 4 years with a northern inlet in the vicinity of the 1990 opening, and a southern inlet at the location of the breach. Sometime after 1996 the northern inlet closed and the system began another cycle of northerly inlet migration. Between 1996 and 2015 the inlet migrated nearly 1.0 mile to the north, back to the location of the 1990 inlet (Figure 4). This represents the most northerly position of the inlet since the early record keeping in 1779.

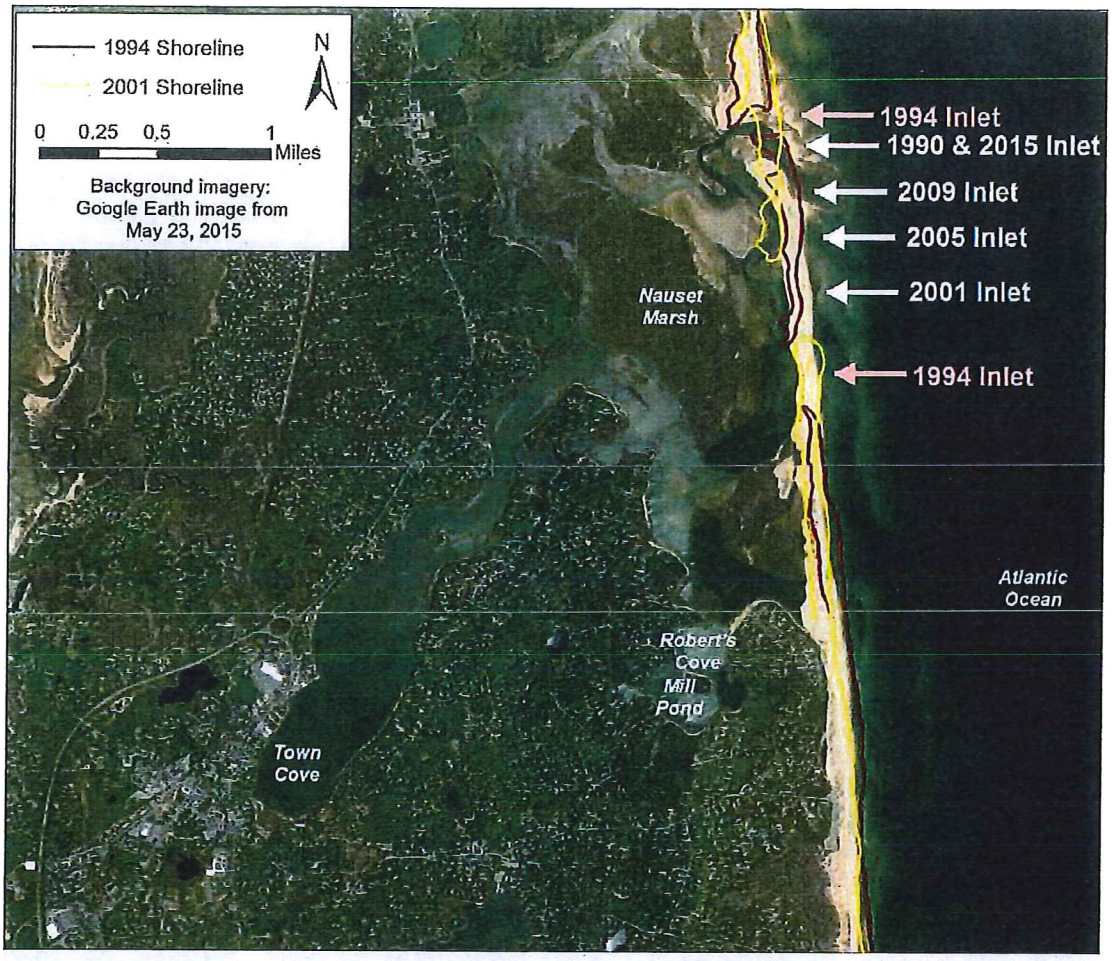

Figure 4. Nauset Estuary Inlet migration between 1990 and 2015.

These cycles of northerly inlet migration, punctuated by breaching to the south, have an influence on the location of the main channel in Nauset Estuary behind the barrier beach. As the spit lengthens to the north pushing the inlet further north, the channel becomes elongated and the hydraulic efficiency of the channel is reduced. Incoming tidal currents bring sediment from the ocean side to form flood shoals and overwash processes during storms deposit sediment in the channel along the west side of the barrier beach. These shoaling processes further reduce the efficiency of the channel. Eventually storms cause the formation of a new breach further to the south where the channel has a more direct link to the ocean. Historical breach locations just north of Tern Island are largely related to the location and orientation of the main channel which directs ebb currents towards the back side of the barrier beach. With enough hydraulic head between the estuary and the ocean, scouring on the west side of the barrier can result in the formation of a new breach from the estuary side. The scouring can also cause a thinning of the barrier beach just north of Tern Island, which weakens the barrier and increases the potential for overwash and breaching from the ocean side.

Historical data indicate that the Nauset Estuary channel between Tern Island and the current inlet location is highly dynamic and strongly influenced by the continuing geomorphologic evolution of the inlet and barrier beach. The data also suggest that a breach in the vicinity of Tern Island is likely to occur in the future. In fact, a washover just north of Tern Island was reported at high tide on February 9, 2016. Whether this develops into a full breach this winter is uncertain. What is clear however, is that a new inlet near Tern Island would allow the Town to temporarily abandon the northern section of channel behind the current barrier beach, in lieu of the more direct channel through the new inlet.

Longshore sediment transport rates and directions along the Eastham/Orleans ocean facing coastline have been studied by Zeigler (1954, 1960), US Army Corps of Engineers (1969) and by Geise (1988). The studies report a net southerly littoral drift with rates ranging between 230,000 and 250,000 cubic meters per year. Sediment is derived from erosion of coastal banks further to the north. The history of northerly inlet migration at Nauset Estuary, in a direction opposite the dominant longshore sediment transport, is contrary to patterns of migration at most other natural inlets. Aubrey and Speer (1984) analyzed historical charts, aerial photos, and storm histories from the area to develop a conceptual model that explains the inlet migration patterns.

The main channel in Nauset Estuary that runs along the west side of the barrier beach is the most dynamic part of the system and is subject to shoaling from inlet processes, barrier formation, and storm generated overwash. However, channel areas further inside the estuary are subject to shoaling as well. A qualitative assessment of channel shoaling was conducted using historical aerial photos from 1972 to the present. Areas of major shoaling were identified on the photos, digitized within a geographic information system (GIS), and then compared over time. This process is influenced by the stage of the tide at the time the photography was collected as well as the ability of the photo interpreter to utilize a consistent proxy for shoaling from one set of photography to the next. Despite these inaccuracies the method provides a reasonable first approximation of areas within the estuary that are prone to shoaling.

Results of the historical shoaling analysis are compared with shoal areas identified from a recent bathymetric survey conducted in November 2015 (Figure 5). The data show significant variability in channel shoaling immediately west of the barrier beach, caused by inlet and barrier migration and storm overwash processes. Patterns of channel shoaling are also evident further inside the estuary where the geometry changes from a narrow constricted channel to a wider configuration. This is consistent with typical flow dynamics where sediment moving with the higher velocity currents in the narrower channels, drops out of suspension when the channels widen and the current velocities decrease. In general the historical shoal locations correspond with current patterns of shoaling from the November 2015 survey, and also with problem areas identified by the Town of Orleans.

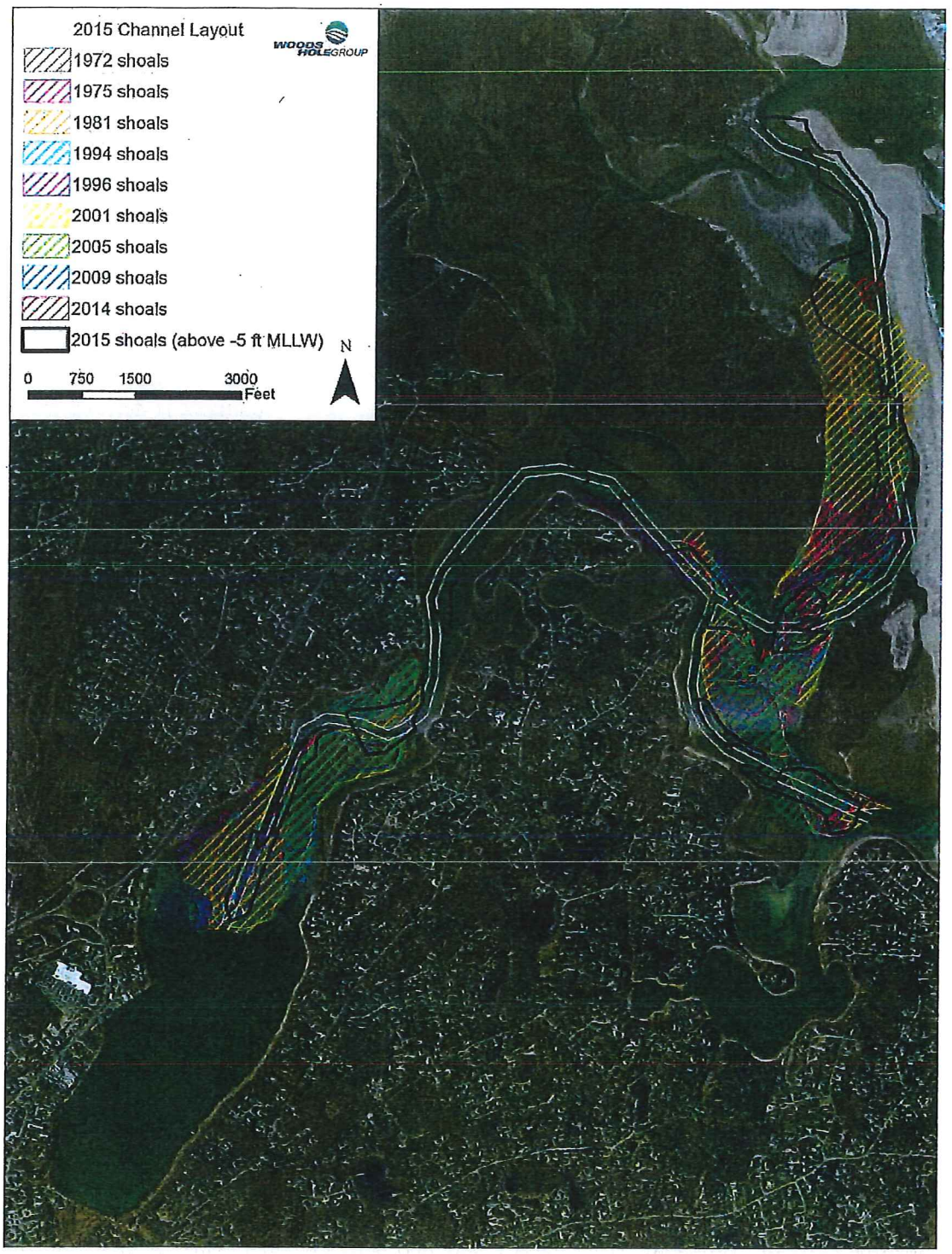

Figure 5. **Patterns of historical shoaling in the Nauset Estuary channels compared with current shoal locations surveyed in November 2015.**

2.2 BATHYMETRY

The current water depths and shoal locations in the Nauset Harbor estuary were documented via a bathymetric survey conducted on November 23 and 25, 2015. The purpose of the survey was to document existing conditions and to provide information needed to plan a dredge channel layout and compute dredge volumes.

The bathymetric survey was performed by a two-person survey crew including an ACSM/THSOA certified hydrographer. The crew was equipped with a Novatel RTK Global Positioning System with 20Hz update rate and an Innerspace Model "455" survey grade digital depth sounder with a narrow beach 200 kHz transducer and 20 depth/sec update rate. The Model 455 depth sounder incorporated transducer draft corrections, calibration for speed of sound through water and gain control. Calibration was accomplished by performing "bar checks" at the beginning and end of the survey day. Water level was continuously monitored during the survey using a VP electronic tide data recorder. As back-up the water levels were also monitored via the RTK GPS system. The recorded tidal data were used to correct the depth soundings to the NAVD88 vertical datum.

Since the bathymetric survey was collected to aid in channel design for navigation purposes, corrections from NAVD88 to the mean lower low water (MLLW) tidal datum were needed to compare with controlling water depths needed for safe navigation. Typically tidal datum corrections are derived from analyses of long-term tide gage data collected at nearby locations. However, in the case of Nauset Estuary, the closest long-term tide gage stations are in Boston Harbor and Chatham Harbor (Fish Pier), and these locations are not representative of tidal nonlinearities in the estuary. A 29-day tide gage deployment at various locations in the estuary in support of the Massachusetts Estuaries Program (MEP) during the fall of 2001 was identified as the best source of water level data for developing tidal datum corrections (Howes et al., 2012). The data show that MLLW in Nauset Harbor and Town Cove is approximately equal to zero NGVD29 (Figure 6). NOAA's VertCon program was used to determine that NGVD29 is 0.9 ft lower than NAVD88, and therefore a correction of 0.9 ft was used to convert the NAVD88 bathymetry to MLLW (ex. -5.0 ft NAVD88 depth equals -4.1 ft MLLW depth).

A color shaded map of the November 2015 bathymetric survey, with depths referenced to MLLW, is shown in Figure 7. Depths in the main channel range from -32.5 to 0.7 feet (MLLW). The shallowest areas of the channel are west of the barrier beach. A number of isolated shoals with depths less than -5.0 MLLW are located along the channel. These shoal locations correspond closely with the locations of historical shoaling shown in Figure 5.

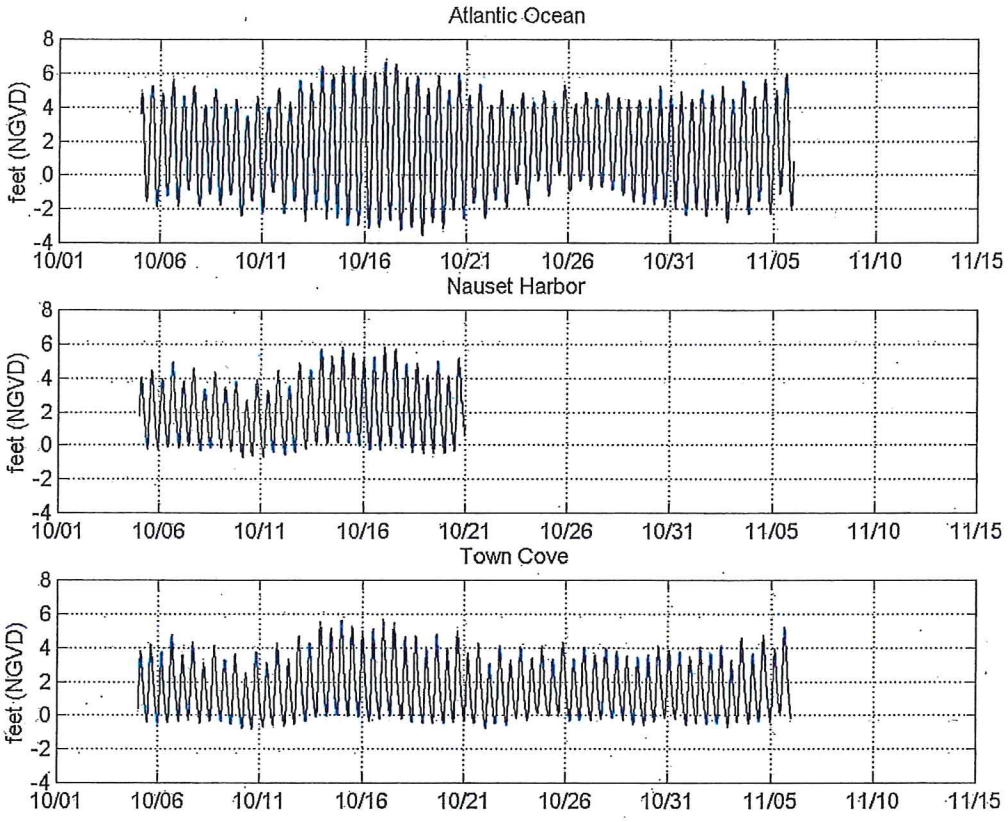

Figure 6. **Water level measurements collected Nauset Estuary in support of the MEP in 2001 used to develop a tidal datum correction between NAVD88 and MLLW (Howes et al., 2012).**

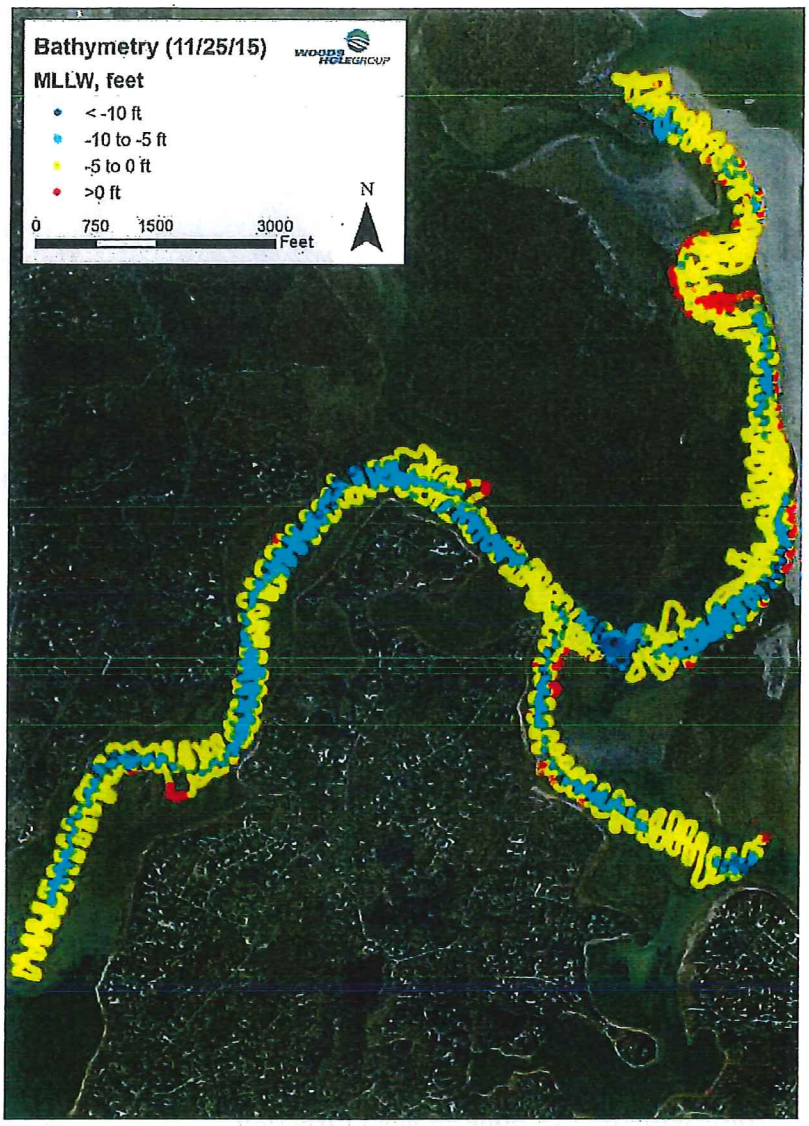

Figure 7. Color shaded map showing water depths referenced to MLLW from the November 2015 bathymetric survey.

2.3 HYDRODYNAMICS

A hydrodynamic model previously developed for Nauset Estuary was used to assess the current hydrodynamic conditions, as well as potential changes that may result from a dredging program. The Finite Volume Coastal Ocean Model (FVCOM) (Chen et al. 2003) used an unstructured grid with node spacing ranging from a minimum of less than 10 m in the estuary to 4 km on the open boundary (Fig. 8). High-resolution bathymetry was used for the model from LiDAR-derived topographic maps of Cape Cod National Seashore from the U.S. Geological Survey (USGS) (Brock et al. 2007). Bathymetry in subtidal regions too deep for LiDAR penetration was based on previous acoustic surveys and observations by investigators from the USGS (Cross et al. 2006) and Woods Hole Oceanographic Institution (WHOI) (Aubrey et al. 1997). The model was previously

evaluated against observations of water level, salinity, temperature, and velocity from moored sensors at multiple locations around the estuary (Ralston et al. 2015).

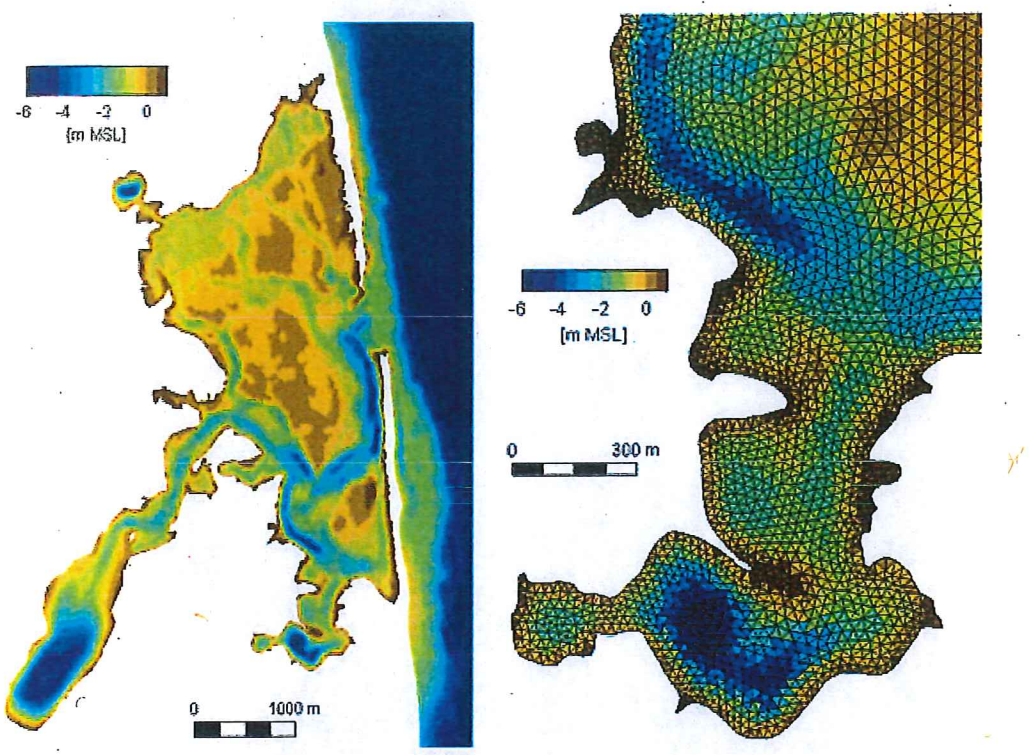

Figure 8. **Model bathymetry, with a zoom on the unstructured grid configuration in the vicinity of Mill Pond. Model open boundaries (not shown) extend north, south, and offshore from the inlet approximately 15 miles in each direction.**

For the current study the model grid bathymetry was updated based on data collected during the November 2015 bathymetric survey in the vicinity of the planned dredging program. Note that the 2015 configuration of the south spit is approximately 660 ft north of the previous model grid based on the inlet position in 2007. For this study no attempt was made to change the model grid to reflect the more northerly inlet location because the model was being used in a diagnostic sense to evaluate relative changes in flow patterns between the no dredge/dredge condition. Modeling shows that Nauset Estuary is a flood dominated inlet, meaning that peak incoming flood currents are stronger than peak outgoing ebb currents. Flood dominated systems tend to be sediment sinks, as more material is transported in during the flood tide than can be exported on the ebb tide.

2.4 SEDIMENTS

Sediment characteristics and distributions throughout Nauset Estuary
part of this study to determine the quality of sediment required for
evaluate the feasibility of different placement alternatives. Two phases
conducted to help characterize the site and maximize use of available
sampling methods and results are described in the following report sectio

Initial confirmatory grab sampling was conducted within the planned
validate sediment characteristics documented by previous studies. The purpos
confirmatory sampling was to gather information to identify targeted areas for sul
vibracore sampling, with specific emphasis on identifying boundaries between s
fine-grained sediments. Confirmatory sediment grabs were collected at sixteen (
on November 30, 2015. A Van Veen grab sampler was used to collect samples
upper 6-12 inches of the sea floor. Sediment characterizations were conduc
trained sedimentologist based on visual and textural observations. Result
qualitative assessment shown in Figure 9 indicate that sediments in the main
were mostly sand and silty sand. Samples from Town Cove and the southeast
channel leading to Priscilla Road Landing contained finer-grained materials char
as sandy silt. While the confirmatory samples provided a qualitative measure of
characteristics at the near surface, core samples were subsequently collected tc
sediments at depth that would be more representative of the entire volume of
potentially removed via dredging.

Results of the confirmatory sediment sampling and the bathymetric survey wer
develop a plan for sediment coring at six (6) locations to quantify material th
need to be dredged from the primary shoal areas. The coring was cond
December 10, 2015 using a shallow draft pontoon boat specially equipped w
frame, winch, anchoring spuds, and a vibracore unit. The coring was conduc
approximate depth of -6.0 ft MLLW determined based on water depth, tide elev
time of coring. The cores ranged in length from 2.7 to 6.6 ft depending on wate
each site. Sample locations were recorded using a RTK GPS. The cores were
in clear polycarbonate liners and transported to the Woods Hole Group office w
were split, photographed, described, and sub-sampled. The sub-samples were s
GeoTesting Express, Inc. in Acton, MA for grain size analyses. Results of the l
analyses show the sediments to be sand or silty sand (Figure 9). The only
containing higher percentages of silt were in Town Cove and near Priscilla Roa
where the upper 0.2 to 0.6 ft of sediment contained in excess of 30% silts and c
core log descriptions and photographs are provided in Appendix A and the l
grain size testing results are provided in Appendix B.

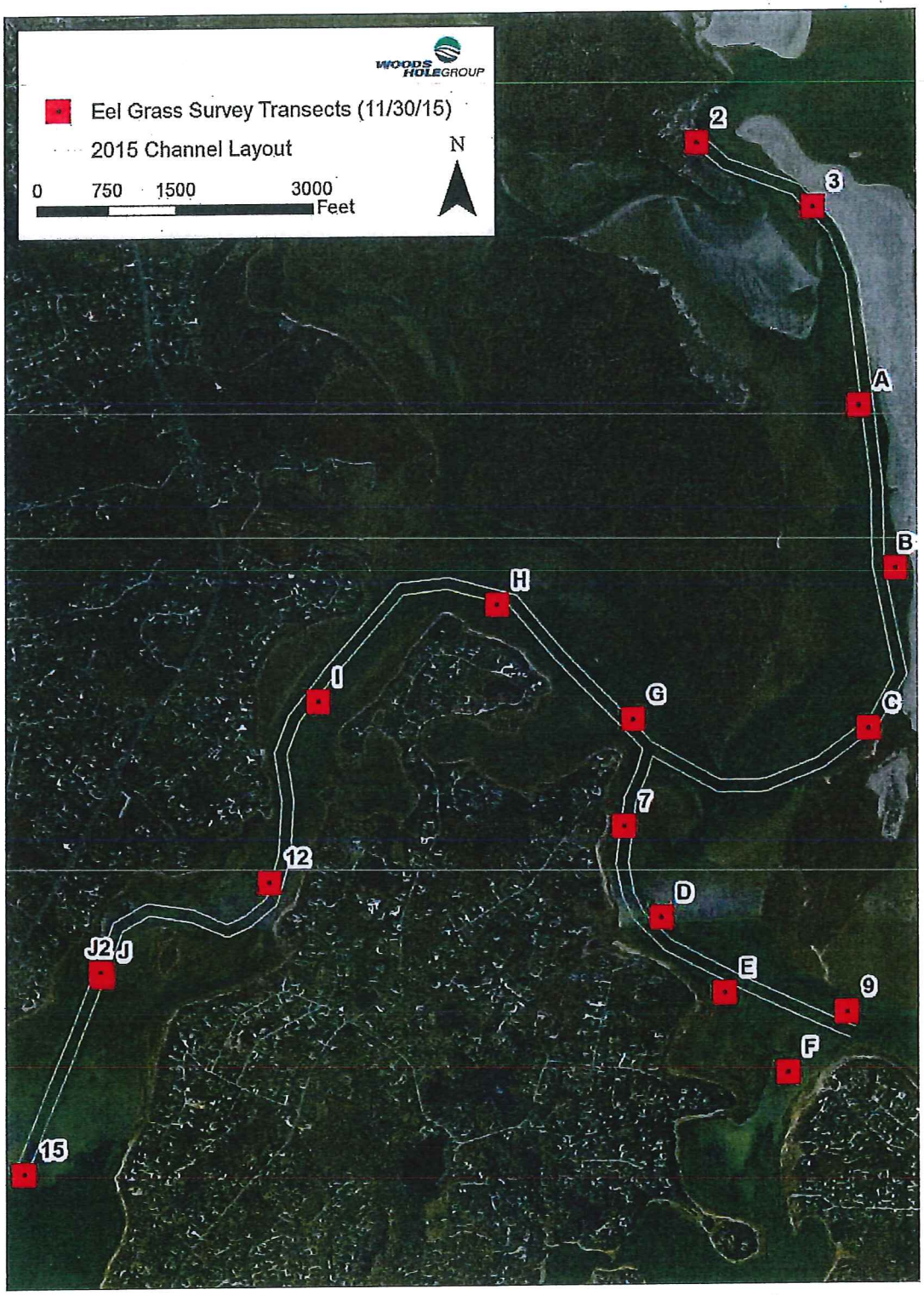

Figure 10. Eelgrass survey transect locations evaluated in November 2015.

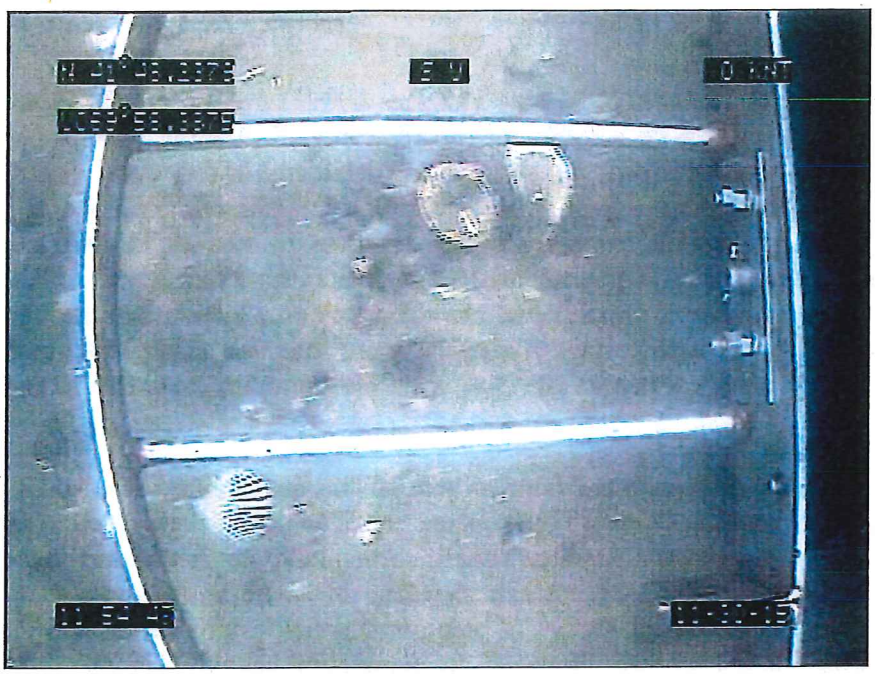

Figure 11. **Example image from the November 2015 eelgrass video survey. Bottom cover was mostly sand with shell fragments.**

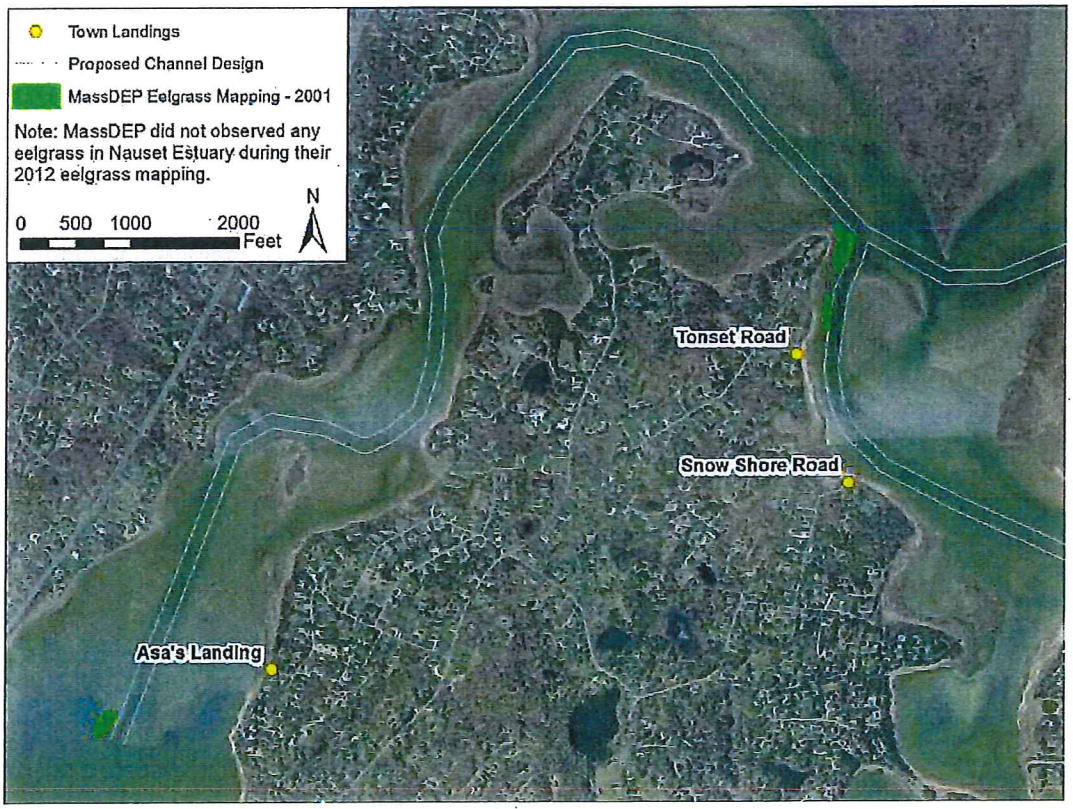

Figure 12. **Historical eelgrass mapping results from MassDEP's Eelgrass Mapping Project.**

Shellfish Resources

The Massachusetts Division of Marine Fisheries (DMF) has produced a map outlining areas that are believed to be suitable for specific types of shellfish, such as blue mussel, quahog, and soft-shelled clam. These areas are delineated based on the expertise of the DMF staff, in conjunction with input from local shellfish constables, commercial fishermen, and information contained in maps and studies of shellfish in Massachusetts. These areas include places where shellfish have been observed since the 1970s, and have a habitat that is suitable to support that particular type of shellfish, but there may not be any shellfish present at this time. Therefore, these shellfish suitability maps represent *potential* habitat areas. A map of the DMF shellfish suitability areas in Nauset Estuary is shown in Figure 13.

Although no field surveys were done as part of this preliminary assessment, shellfish constables from both the Town of Orleans and the Town of Eastham were interviewed to identify current locations of important shellfish populations. In Orleans, there are high densities of quahogs along the eastern shoreline of Town Cove, north to the area of Hopkins Island. There is also a set of blue mussels that establishes around the channel near Hopkins Island each year; however, the population has not been able to survive the winter during the last few years, either getting scoured by ice or predated by eiders, but has regularly recolonized the area each year. Most recently this blue mussel set was observed on the Eastham side of the channel.

Shellfish constables from both towns noted a high density of shellfish in some of the shoals that have developed. In Orleans, there have been significant quahog, soft-shell clam, and razor clam populations recently in the sandy shoals near Priscilla Road and Snow Shore Landings. While in Eastham, soft-shell clam and surf clam have been observed in the tidal flats near Nauset Inlet. In general, both shellfish constables noted no significant populations of shellfish within the majority of the historic navigation channel.

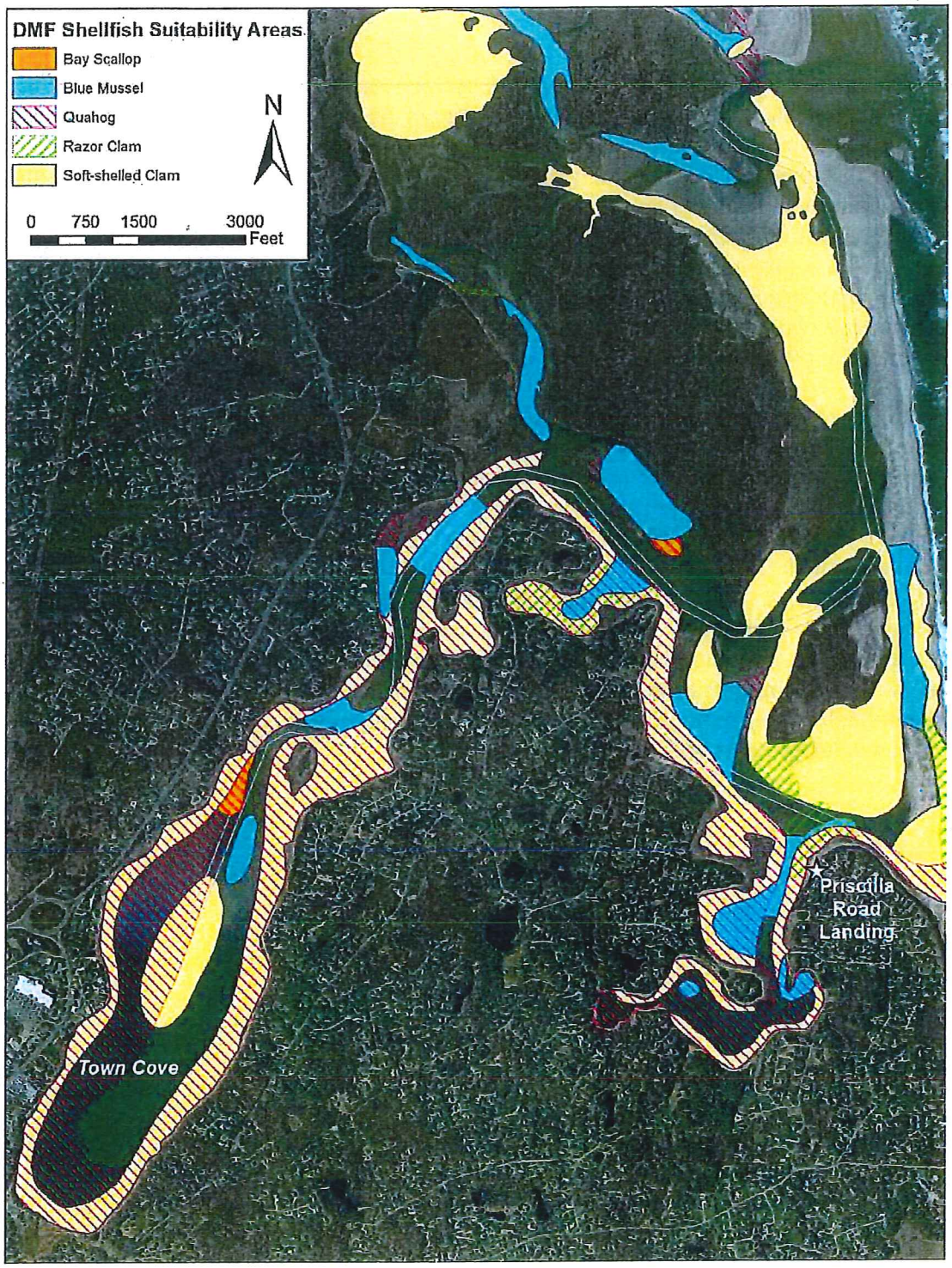

Figure 13. Mass DMF shellfish suitability map for Nauset estuary.

Endangered Species

The Estimated and Priority Habitats of rare species mapped by the Natural Heritage and Endangered Species Program (NHESP) represent the geographic extent of state-listed rare species in Massachusetts based on observations documented within the NHESP database. Estimated Habitats are a subset of the Priority Habitats, which do not include areas delineated for rare plants or wildlife with strictly upland habitat requirements. The Estimated and Priority Habitats within and around Nauset Estuary are presented in Figure 14. When a project falls within Priority Habitat and does not meet a Massachusetts Endangered Species Act (MESA) filing exemption (321 CMR 10.14), it is necessary to file directly with the NHESP pursuant to MESA. For projects within Estimated Habitats that require a Notice of Intent (NOI), a copy of the NOI must also be sent to NHESP.

While specific species driving the habitat designations shown in Figure 14 are not currently known because a MESA information request has not been submitted, other reports produced by NHESP provide some indication of which species might be present. Although, the Natural Heritage BioMap2 program serves only as a conservation tool, without any regulatory significance, and does not supplant the Estimated and Priority Habitats which do have regulatory significance, it does combine decades of documented rare species data, and can provide useful insight into species of concern that might be found in a particular area. For example, the entire ocean-side shoreline of the outer cape is identified as important nesting and foraging habitat for Piping Plovers and Least Terns, as well as an important staging area for Common and Roseate Terns (NHESP 2012). Additionally, the BioMap2 report indicates that American sea-blite is a species of concern along the eastern shore of Town Cove.

Figure 14. Natural Heritage and Endangered Species Program Estimated and Priority Habitats in Nauset Estuary.

2.6 RED TIDE

Background and past studies

Harmful algal blooms (HABs, commonly called "red tides") are a serious economic and public health problem throughout the world. In the U.S., the most serious and widespread manifestation is paralytic shellfish poisoning (PSP), a syndrome caused by human ingestion of shellfish that accumulate toxins from dinoflagellates, predominantly in the genus *Alexandrium*.

In many parts of the world, PSP is a recurrent and serious problem associated with blooms of toxic dinoflagellates in the genus *Alexandrium*. The potent neurotoxins produced by these organisms are accumulated by filter-feeding shellfish and other grazers and are passed on to humans and other animals at higher trophic levels, leading to illness, incapacitation, and even death. *Alexandrium* species cause toxicity in many different hydrographic and climatic regimes, from temperate to tropical. One reason for growth success across such a variety of habitats is that many species have a cyst stage in their life histories. This allows the organism to remain dormant in bottom sediments through temperature extremes (e.g., winter), with seasonal germination inoculating vegetative cells into the water column only during intervals where temperature and light are suitable for growth (Anderson et al., 2012). Population development is thus possible in more locations than would otherwise be the case if year-round persistence in the water column were the only means for survival.

There are two types of *Alexandrium* blooms in the New England region, both caused by the species *A. fundyense* (hereafter referred to simply as *Alexandrium*). One occurs along the open coast of the Gulf of Maine from the Bay of Fundy to Massachusetts and outer Cape Cod, and on rare occasions, this distribution stretches to the islands of Nantucket and Martha's Vineyard and occasionally, to Rhode Island (i.e., Anderson et al., 2005a; Anderson et al., 2005b; Borkman et al. 2014). Blooms in the coastal region of the Gulf of Maine can stretch over hundreds of miles and last for several months.

The second type of *Alexandrium* bloom in the region is much smaller in scale and is representative of the blooms that occur in the Nauset Estuary system. *Alexandrium* blooms occur, but those episodes are sporadic and highly independent of each other or of the large-scale coastal blooms described above. Instead, isolated and localized blooms occur in those areas, with very tight linkage in time and space to cyst populations in bottom sediments of the areas where toxicity occurs. These locations can be viewed as self-seeding "point sources", in that *Alexandrium* populations originate within the embayments or estuaries, with no input of cells from coastal waters, and they deposit cysts after those blooms, to "seed" future blooms. These "localized" or "point source" blooms have been well studied by D. M. Anderson and colleagues (e.g., Anderson et al. 1983; Anderson and Stolzenbach 1985; Crespo et al. 2011; Ralston et al. 2013, 2015; Brosnahan et al. 2014).

The distribution of the *Alexandrium* blooms within Nauset Estuary is not uniform. It has been well established that the hot spots of toxicity occur at the three distal end points of the system - namely Salt Pond, Town Cove, and Mill Pond (collectively termed salt

ponds hereafter). Although the central marsh does occasionally show dangerous levels of toxicity, the highest and earliest levels are always recorded within these salt ponds, with the toxicity in the central marsh delivered there from the localized blooms. In all cases, the salt ponds have deeper central portions (kettle holes), with water exchange with the central marsh limited by shallow, restricted inlet channels. Figure 15 shows the distribution of cysts in Nauset Estuary in 2008, 2009, and 2011. Figure 16 shows a time series of *Alexandrium* cell abundance between March and May 2009. Clearly, there is a strong linkage between the location of the cyst accumulations and the origins of the Nauset blooms, with cells first appearing in Mill Pond, then Town Cove and Salt Pond, with low abundances observed in the central marsh, and no connectivity between the three salt ponds.

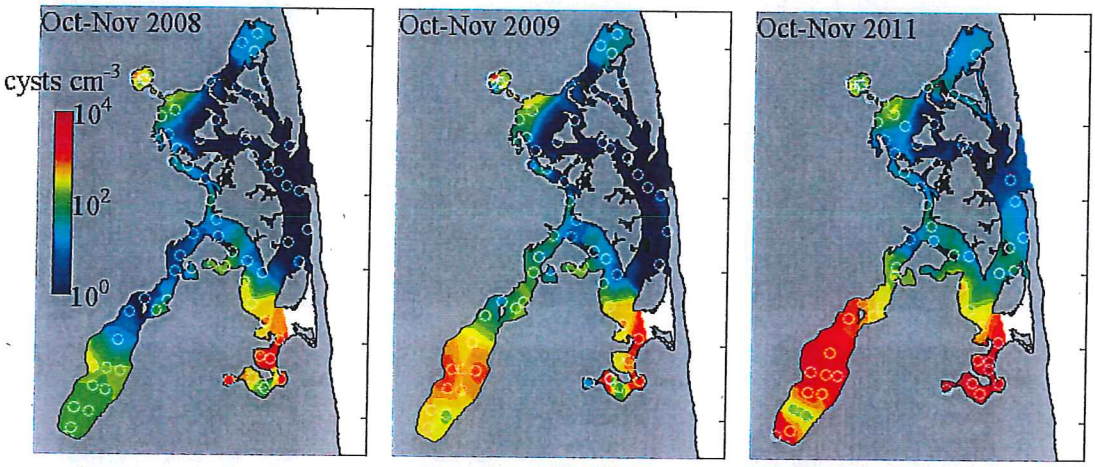

Figure 15. Contour maps of Nauset Estuary mean *A. fundyense* cyst concentrations (cysts/cm^3) in: (left) 2008, (center) 2009, and (right) 2011. Gray circles indicate sample sites (From Ralston et al., 2015).

There are two reasons why these three locations are persistent hot spots for *Alexandrium* and toxicity. The first is that they are accumulation zones for the cysts of *Alexandrium* because of their bathymetry and hydrography. As flood tide-dominated systems, Salt Pond, Mill Pond, and Town Cove accumulate fine sediments year after year, and cysts behave like that fine sediment fraction. Cysts that are formed within the central marsh tend to be disbursed with other fine sedimentary material, much of which ultimately accumulates in kettle holes like the salt ponds and the areas that have silted in near their inlets. The bulk of the *Alexandrium* cysts formed within Nauset Estuary are thus retained within the salt ponds.

The second mechanism that leads to the hotspots results from a combination of the bathymetry and configuration of the salt ponds and the behavior of *Alexandrium*. *Alexandrium* swims vertically in the water column, seeking the appropriate amount of sunlight for photosynthesis in surface waters, while also swimming downward to access nutrients that are often found in deeper waters. This is termed diel vertical migration. *Alexandrium*, however, does not swim to the very surface of the water, but instead finds

suitable sunlight 1.5 - 2.5 meters deep (Anderson and Stolzenbach 1985). This means that the top of the vertical ambit of *Alexandrium* tends to be below the depth of the shallow inlet channel. Thus the water that leaves the salt ponds on ebb tides contains few cells compared to those retained within the ponds. The population is thus retained within the ponds, dividing and accumulating, and reaching dangerous levels of toxicity. For example, Salt Pond has had closures due to toxin levels above quarantine action limits in 23 of the past 26 years. Similar numbers hold for Mill Pond and Town Cove.

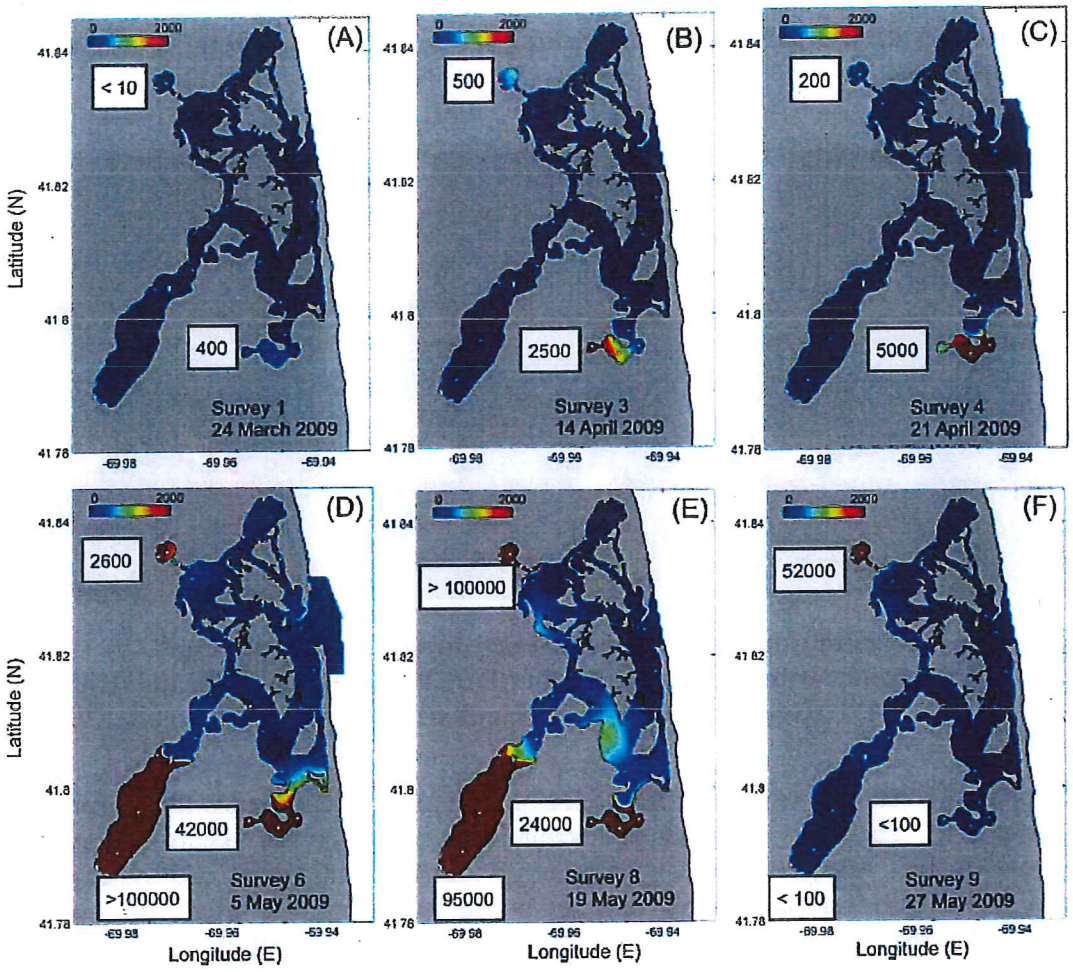

Figure 16. **Distribution of Nauset Estuary *A. fundyense* cells (cells L^{-1}) between March 24 and May 27, 2009. Maximum number of cells for Mill Pond, Town Cove and Salt Pond indicated in the white squares. White dots indicate sample sites (From Crespo et al., 2011).**

Another important feature of the *Alexandrium* bloom dynamics is that the cysts in bottom sediments do not just sit at the surface of those sediments. Bioturbation (i.e. mixing by worms and other bottom-dwelling animals) as well as physical mixing from storms and

currents can bury the cysts. It is common to find more cysts a few centimeters below the surface than there are at the surface, as shown in a core profile taken in Roberts Cove, immediately adjacent to Mill Pond (Figure 17). However, dinoflagellate cysts require oxygen for germination (Anderson et al. 1987), and typically oxygen is only found in the top centimeter or less of bottom sediments. This means that cysts that are buried below that layer typically do not germinate and participate in the bloom formation in the spring. Instead, they remain dormant and either eventually die, or are mixed to the sediment surface or the water column by storms, bioturbation, or other disturbances. There are reports that *Alexandrium* cysts can live in anoxic sediments for decades (Keafer et al. 1992); there are even reports of successful cyst germination that were over 100 years old (Ribeiro et al. 2011). Clearly, activities that might resuspend deep cyst deposits (i.e., dredging) have the potential to introduce cysts that otherwise would not have germinated, into conditions that would be favorable for germination.

One important conclusion from Figure 17 and from many other cyst profiles in sediment cores is that in Nauset Estuary, *Alexandrium* cysts are quite low in abundance below 10 cm (D. M. Anderson, unpub. data). For this reason, the cyst abundance in the top 0-10 cm layer is most important when considering the impacts of dredging operations.

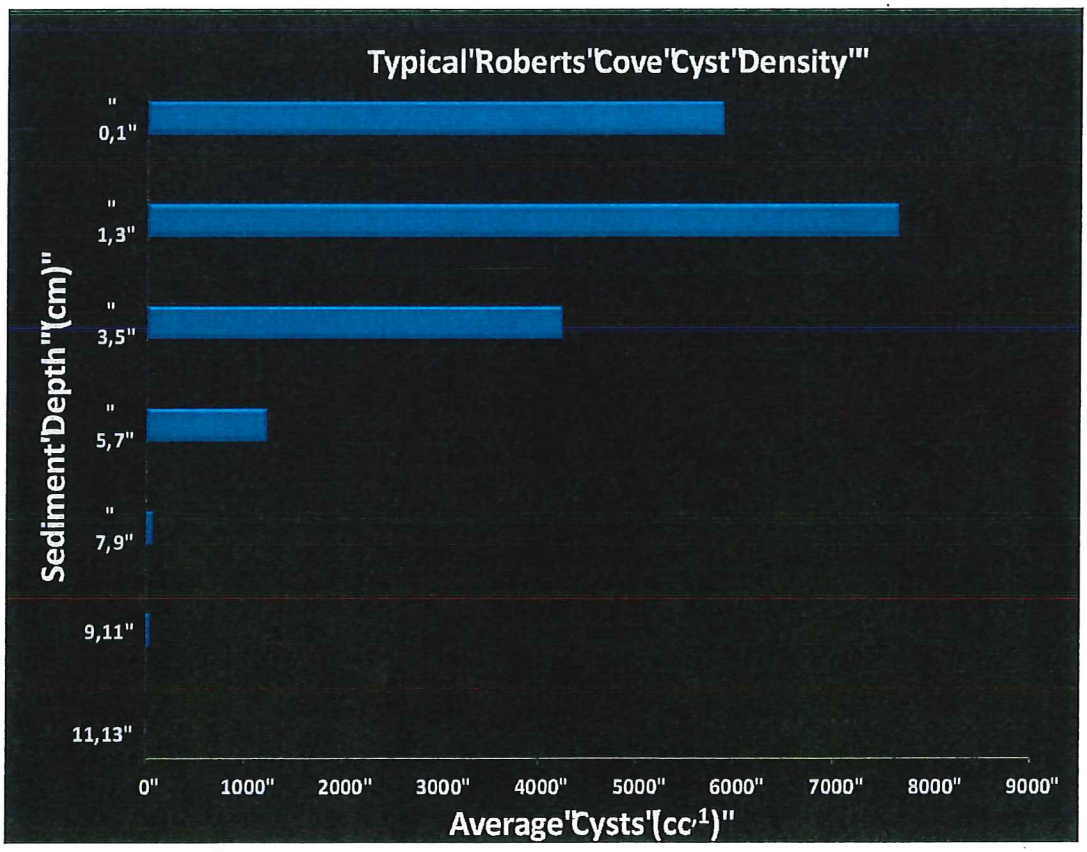

Figure 17. Vertical profile of *Alexandrium* cyst abundance (cysts/cm^3) from Roberts Cove in the Nauset Estuary.

It is also important to recognize other factors that regulate the timing and extent of *Alexandrium* cyst germination. Foremost among these is seasonality in germination that is internally controlled by a "clock" mechanism. The timing or phasing of this "endogenous clock" is in turn regulated by temperature. It is a complicated process that is still under active investigation, but for the purpose of this discussion, suffice it to say that most newly formed cysts that are deposited in the summer or fall from *Alexandrium* blooms typically cannot germinate during the early winter because of a combination of maturation processes and clock regulation. Germination is typically possible beginning in January or early February, but the rate of that germination is controlled by ambient temperatures. In very cold winters, germination is delayed until waters reach 4-6 °C. At those temperatures, the cysts can germinate, but the *Alexandrium* vegetative cells that are produced grow very slowly, if at all, again because of non-optimal temperatures. An indication of the growth potential of *A. fundyense* from Roberts Cove is described in a study by Watras et al. (1982). In general, a temperature range for survival and growth between 5.5 and 24 °C was observed. There was no growth at 5.5 °C, but the cells did not die. At 8.5 °C, the rate ranged from 0.08 to 0.2/day depending on salinity. The maximum growth rate was 0.44/day, at 22.5 °C. A broad optimum for growth occurred between 13 and 22.5 °C.

Interestingly, *Alexandrium* cells also do not germinate or grow when it becomes too warm (Anderson 1998). Typical summer temperatures of 23-28 °C are inhibitory in this regard.

Some useful information is presented in Figure 18, which shows multiple blooms of *Alexandrium* in Roberts Cove from 2009 to 2015, as well as the bottom temperature, and the rate of cyst germination at ambient temperatures. Bloom initiation tends to vary interannually, with the earliest cells seen in February, but more often, March. Peak motile cell concentrations occur in April and May, and the blooms terminate in late May and early June. Anomalous years like 2012 (yellow curve in Figure 18) show a shifted bloom dynamic, but otherwise the same general shape.

The middle panel of Figure 18 shows the germination success of cysts at ambient temperatures. This would be analogous to the situation if sediments containing cysts were resuspended or dumped into the oxygenated surface waters during a dredging operation. The pattern indicates that germination does occur in the fall and early winter, but is generally near zero in January and February, increasing thereafter. Note that the lack of germination in the mid- and late-summer months (June – September) is due to newly deposited cysts being immature at the time of the incubation. Cysts that were mature but buried in anoxic sediment layers would be expected to germinate at those times.

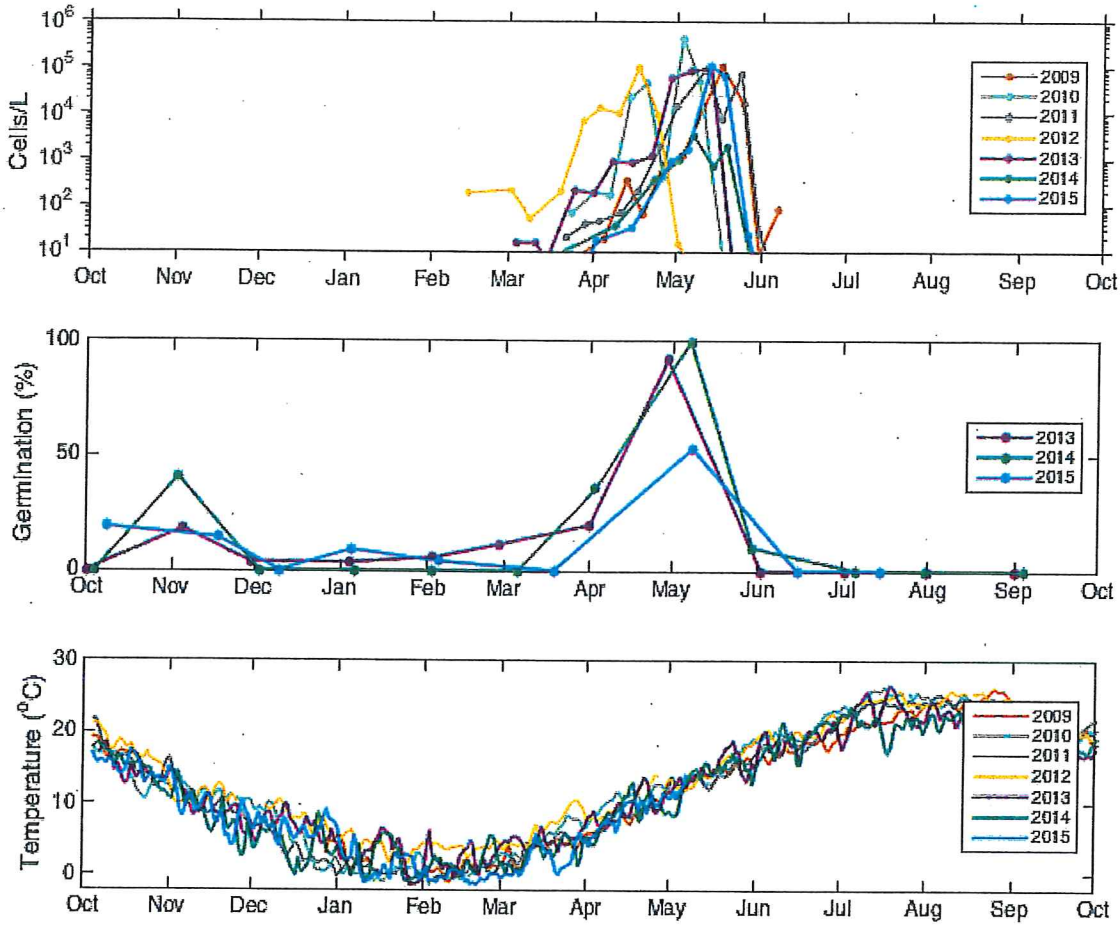

Figure 18. ***Alexandrium*** **motile cell and cyst dynamics from Roberts Cove in Nauset Estuary. Top panel:** ***A. fundyense*** **cell abundance by month. Middle panel: Cyst germination success in surface sediment samples collected and incubated at the ambient water temperature. Bottom panel: temperature (°C). (From A. Fischer, unpub. data).**

2015 red tide cyst assessment

To evaluate current red tide conditions in Nauset Estuary sediment cores were collected at 10 sites on December 10, 2015 for analysis of red tide cysts (Figure 19). The sample locations were planned to coincide with previous red tide cyst analyses conducted by others. A push-core sampling device equipped with a 2 5/8 inch inner diameter clear polycarbonate barrel was used to collect the cores. To ensure sufficient retrieval depth, the cores were pushed to a penetration depth of 1.5 feet. A piston assembly inside the core barrel was used to create suction, thereby preventing excessive compaction during core barrel penetration, and loss of sediment from the bottom of the barrel during recovery. This method provided an undisturbed sediment core of at least 10 cm in length. Upon collection, the cores were packed in ice and stored at 4 °C in the dark for a maximum of 36 hours prior to processing using standard techniques (Anderson et al., 1982, 2005a).

In brief, the cores were extruded such that the 0-1 cm sediment layer was carefully retained, and the 1–10 cm layer was collected into a plastic basin and completely homogenized by hand. From each layer, a well-mixed 5 cm^3 wet volume sediment subsample was taken and resuspended to 25 mL with filtered seawater. A 10 mL subsample of the 25 ml sediment slurry was sonified using a Branson Sonifier 250 affixed with a 1.25 cm disruptor horn at a constant 40-W output for 1 min, and sieved to yield a clean, 20–80μm size fraction (Anderson et al., 2005).

Alexandrium fundyense cysts were counted in a 1-ml Sedgewick Rafter slide according to standard methods for cyst identification and enumeration (Anderson et al., 2003) using primulin to stain the cysts (Yamaguchi et al., 1995). For this, 10 mL of processed sediment was preserved by the addition of 0.75 mL, 100% ACS grade formalin and returned to 4 °C for at least 60 min. This sample was then centrifuged for 10 min at 3000xg, the overlying water aspirated, and the sediment pellet was resuspended in 10 ml ACS grade methanol and stored at 4 °C for at least 48 h. The sample was centrifuged and aspirated as before, and resuspended in 10 mL Milli-Q water. Following centrifugation and aspiration, 2 mL of primuline stain (2 mg mL^{-1}) was added. The sample was incubated in the dark at 4 °C on a rotating mixer, centrifuged and aspirated, and washed with 10 mL Milli-Q water, centrifuged and aspirated again, and the stained sediment pellet was brought up to 3 to 14 mL with Milli-Q water depending on the volume of the stained sediment pellet. A one mL subsample was enumerated using a Zeiss Imager microscope at 100X total magnification under blue light epifluorescence (Chroma filter set 19002, Chroma Corp, Bellows Falls, VT).

Table 1 shows the results of the sediment coring and cyst analysis, and Figure 19 shows the location of the samples and the distribution of cyst abundance. Cyst concentrations ranged from 0 (central marsh sites) to values as high as 2,446 cysts/cm^3 in the top cm of sediment. The latter site was near Mill Pond and Roberts Cove. Other high values were also in the areas closest to the mouths of the salt ponds. Concentrations in the 1-10 cm fraction were generally much lower than the surface counts at each station, except at station F near Roberts Cove, where 2,941 cysts/cm^3 was measured. Note that these values represent the average cyst abundance over that 9 cm layer.

These 2015 cyst samples were collected and analyzed to allow comparisons between the limited number of samples collected now, and those collected in more extensive, marsh-wide system surveys in 2008, 2009 (Crespo et al., 2011) and 2011 (Ralston et al. 2015). Figure 20 compares cyst abundance at sampling sites from 2008, 2009, 2011, and 2015. It is immediately apparent that the general distribution of *Alexandrium* cysts in the area to be dredged has not changed over these years, and it is also clear that cyst abundance has a similar range to that measured in other years. This is an important observation, and the main justification for taking the samples, as it demonstrates that cyst abundance and distribution within the estuary are generally similar among years. Since the dredging program, if found feasible by the Town, will likely be several years from now, there is confidence that these measurements, and those in the recent past, are a realistic representation of the situation at the time the dredging may eventually occur.

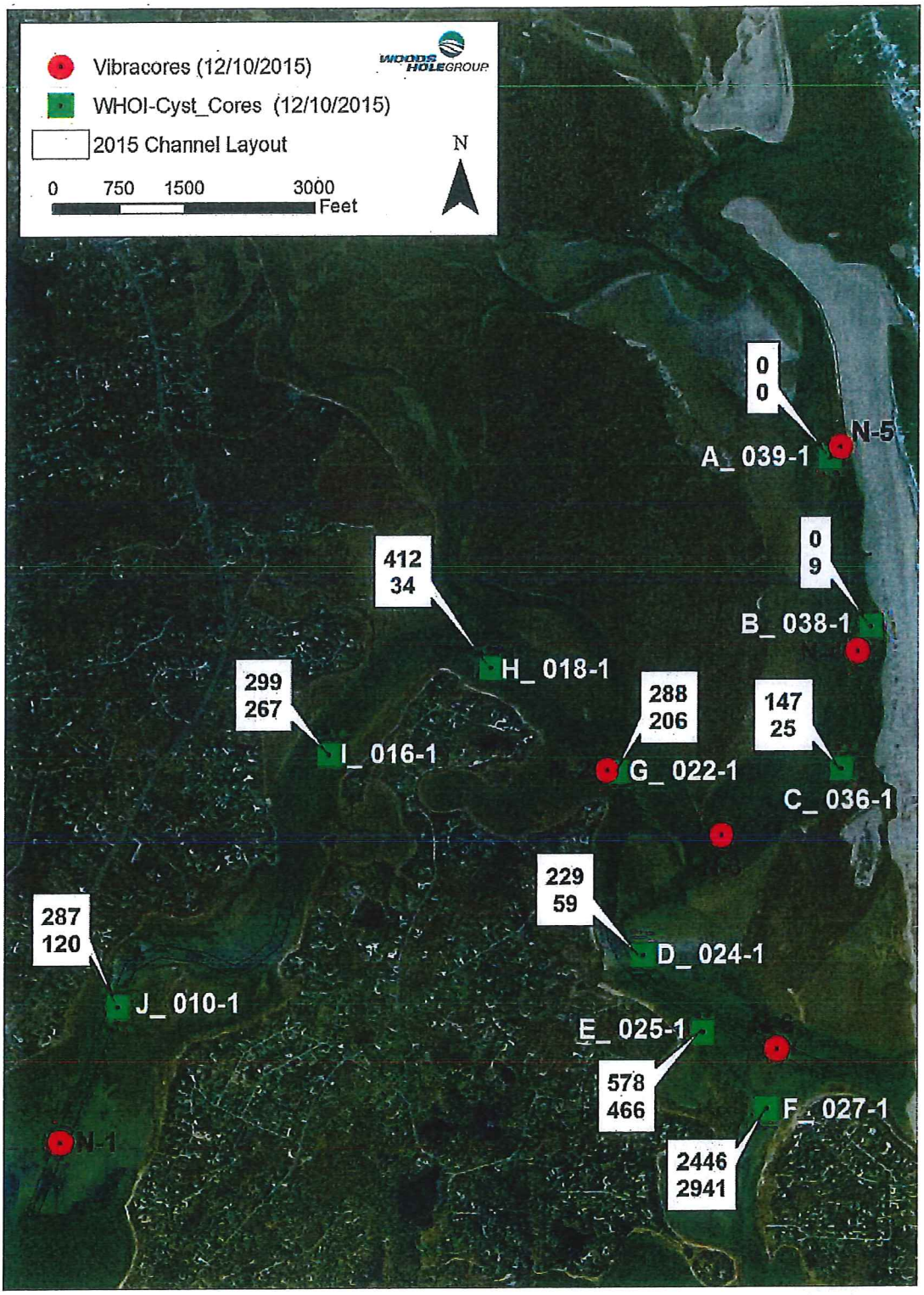

Figure 19. **Map showing cyst coring locations and cyst counts. White boxes near each station show the *Alexandrium* cyst abundances (cysts/cm^3) in the top cm (top line) and 1-10 cm layer (bottom line).**

Table 1. **Summary of 2015 red tide cyst sampling and analysis.**

Core ID	Latitude	Longitude	Core Recovery (ft)	Collection Date & Time	0-1 cm *Alexandrium* cysts/cm^3	1-10 cm *Alexandrium* cysts/cm^3	Sediment Type (visual)
A_ 039-1	41°49.256	69°56.544	1	12/10/15 11:30	0	0	Sandy
B_ 038-1	41°48.876	69°56.504	0.4	12/10/15 11:05	0	9	Course sand
C_ 036-1	41°48.657	69°56.556	1.2	12/10/15 12:22	147	25	Light sand to dark black
D_ 024-1	41°48.32	69°57.059	0.8	12/10/15 12:51	229	59	Dark silt
E_ 025-1	41°48.175	69°56.911	1	12/10/15 13:04	578	466	Mud
F_ 027-1	41°48.031	69°56.756	0.9	12/10/15 13:40	2446	2941	Light sandy silt
G_ 022-1	41°48.668	69°57.143	1.2	12/10/15 10:21	288	206	Sandy silt
H_ 018-1	41°48.86	69°57.437	0.8	12/10/15 14:07	412	34	Dark silt
I_ 016-1	41°48.709	69°57.841	0.8	12/10/15 14:22	299	267	Sandy silt
J_ 010-1	41°48.247	69°58.384	0.9	12/10/15 14:40	287	120	Sandy silt

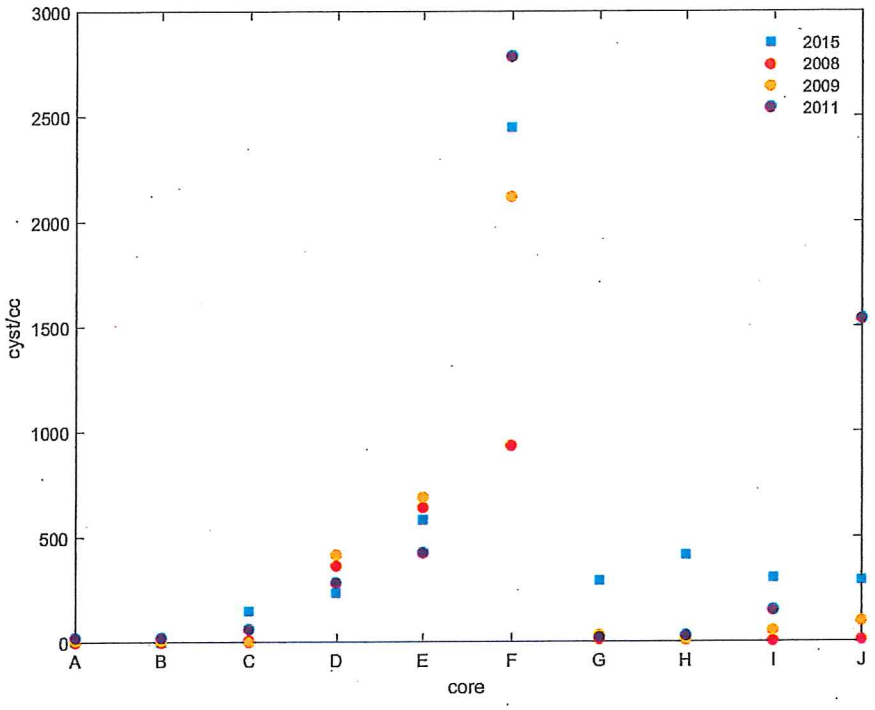

Figure 20. Comparison of cyst abundance at the 2015 core locations with data from previous cyst surveys in 2008, 2009, and 2011.

Red tide cysts in dredged sediments

Observed sediment cyst concentrations and information on the Town's conceptual dredging plan were used to estimate the abundance of red tide cysts in the dredge sediment. The FVCOM model grid bathymetry was used as the basis for the calculations. Cyst concentrations observed at the sample locations were interpolated to the model grid using an inverse-distance weighting approach. The near-surface (0-1 cm) cyst concentrations were used for the spatial distribution. To augment the 10 stations sampled in November 2015, additional near-surface samples (0-1 cm) from the most recent cyst survey of the full estuary during Nov 2011 were utilized (Figure 15). The approach is reasonable given the strong similarities in spatial distributions of cyst abundance across the multiple years of surveys, including those from November 2015 (Figure 20).

The total volume of dredged sediment was calculated by comparing the model grid for the 2015 bathymetry with the grid representing the dredged channel. The amount of material to be removed during the dredging was calculated to be about 73,000 cubic yards, similar to the volume calculated from the bathymetric surveys. The cysts associated with the dredged material were assumed to decrease linearly from the near-surface abundance mapped to the model grid to 0 cysts at 10 cm depth, and equal to 0 in any material below 10 cm. Cyst abundances typically decrease rapidly in the bed over depths of about 10 cm (Figure 17).

Assuming that the cyst concentrations decrease linearly from the surface concentration to 0 at 10 cm depth, and that there are no cysts below 10 cm, the total number of cysts to be removed during dredging was calculated to be 2.2×10^{12}. Dividing that by the dredge volume, an average of concentration in the dredged material of 40 cysts/cm^3 was determined.

2.7 PAST DREDGING ACTIVITIES

Information on past dredging activities in Nauset Estuary was obtained from the Massachusetts Department of Environmental Protection (DEP) and the Division of Conservation and Recreation (DCR). A total of four (4) permits were identified with issue dates between 1924 and 1974 Table 2 provides a summary of the relevant permit information and Figure 21 shows the locations of the specific activities.

Table 2. Historical permits for Nauset Estuary dredging and associated placement.

Permittee	Permitted Activities	Permit/License No.	Issue Date
Mass DPW/ Waterways	Dredging at 3 sites with placement at 4 in-harbor sites	Contract No. 97	May 24, 1924
Town of Orleans	Maintain bulkhead, piers, dredged & fill	License No. 6256	Aug. 1, 1974
Goose Hummock Shop	Maintain bulkhead, piers, dredge & fill	License No. 5853	Dec. 22, 1971
Esther & Melville Richardson	Dredge & fill	License No. 4844	Jul. 28, 1964

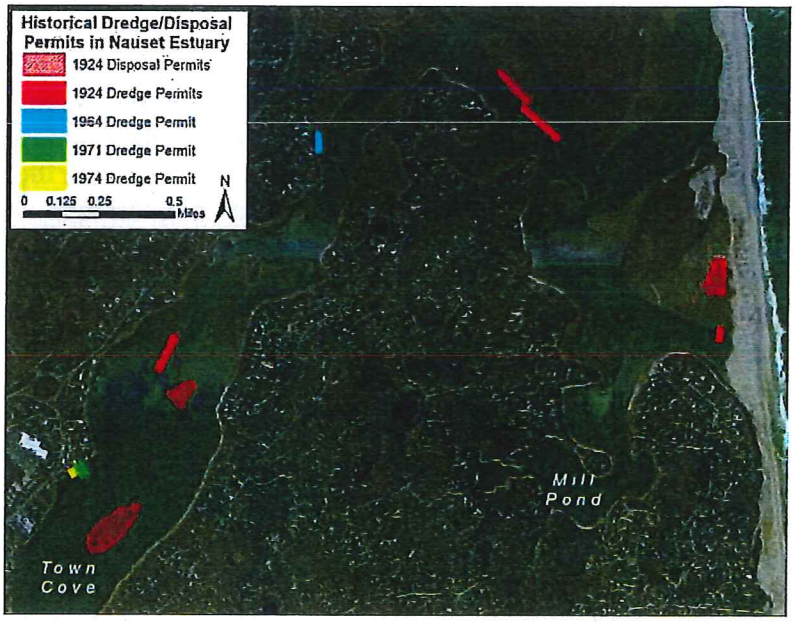

Figure 21. Historical dredging and disposal activities in Nauset Estuary.

3.0 DREDGE AND DISPOSAL PLAN FORMULATION

3.1 TOWN DREDGE CONCEPTUAL PLAN

The Town of Orleans is investigating the feasibility of a dredging program in Nauset Estuary that would improve navigation and public safety. Current shoaling in the channel makes access to the Town landings difficult and dangerous during certain tides. The conceptual channel layout, seen in Figure 1, would facilitate safe passage for navigation not only through the inlet and behind the barrier beach, but also to the key Town landings, such as Priscilla Road, Snow Shore Road, Tonset Road, Asa's Landing, Goose Hummock, and Cove Road, as well as other locations in Town Cove.

To accommodate local boating needs, the Town is investigating a channel design that is 100 feet wide at the base, with 1V:3H side slopes extending an additional 15 feet on each side. The main stem of the dredge channel would extend just over 4 miles from Nauset inlet to Town Cove. A secondary channel, approximately 4,500 feet long would extend south from the main channel towards Robert's Cove, to provide access to Tonset Road, Snow Shore Road and Priscilla Road Landings. The channel would be dredged to a depth of -5 ft at MLLW.

3.2 DREDGE ZONE LAYOUT

The conceptual layout takes advantage of the existing channel and will require significant sediment removal in only a few locations. Figure 5 shows the existing shoals, according to the 2015 bathymetric survey. The major shoal locations are near the inlet and behind the barrier beach, at the first bend in the channel to the south of Nauset Marsh, and towards the upstream end of the channel in Town Cove. However, due to the dynamic nature of the shifting inlet and the resulting change in currents, the exact locations of these shoals changes from year to year. Consequently, the specific areas that need to be dredged today may be different than the areas that need to be dredged a year from now. Given the current bathymetry an estimated total of 80,600 cubic yards of material would need to be removed from the channel to meet the conceptual design described in Section 3.1 (Figure 22). This includes approximately 68,000 cubic yards from the main channel and approximately 12,600 cubic yards from the southern channel.

Due to the dynamic nature of the estuary, the Town is considering an adaptive management approach that would permit a larger dredge zone, rather than a specific channel. This zone is wider than the specific channel layout, and allows flexibility in the future for choosing the optimum dredge route along the deepest part of the natural channel to minimize the volume of dredge material. As part of this feasibility study, a potential dredge zone was developed for Nauset Estuary based on historical variations in the natural channel (Figure 22). At minimum the dredge zone is 300 feet wide near the entrance to Town Cove, and increases to nearly 1,500 feet wide near the inlet. In total, the dredge zone covers approximately 390 acres. However, despite the much larger size of this zone, any particular dredge project would be limited to a 100-foot wide channel within that zone. The total area of dredging in the main channel would not exceed 66 acres and the total area in the channel leading to Priscilla Road Landing would not exceed 13.2 acres. This adaptive management approach would allow the Town to select

a slightly different path for the dredged channel in order to capitalize on the existing channel thalweg, and to minimize costs by removing as little sediment as required.

Figure 22. Extent of dredge zone and 2015 channel layout.

3.3 POTENTIAL ALTERNATIVES FOR PLACEMENT

As with all dredge projects, one of the major factors in determining a project's feasibility is where to place the dredged material. Where material can be placed is driven by a number of factors, including distance from the dredging site, characteristics of the sediment being dredged, natural resources, such as eelgrass, shellfish, and salt marsh, feasibility/need to dewater the material, and ownership/size of the potential disposal site(s).

These factors were used as a guide to evaluate the range of possible placement alternatives for the Nauset Estuary dredge program. Unfortunately, the dense residential development, the paucity of shorefront public-owned parcels, and the close proximity to the Cape Cod National Seashore (CCNS) limited the available options for placement. Five potential placement sites/alternatives were identified; however, two of the alternatives are considered experimental due to the need to collect additional information regarding impacts, suitability, and regulatory review. Descriptions of the placement options are provided in the following section.

Dune restoration at Nauset Beach

Use of Nauset Beach as a dredged material placement site would be optimal for the Town, since the beach is currently experiencing significant erosion and the resilience of the site could be enhanced through dune restoration. In fact, in a study recently completed for the Town by Woods Hole Group (2016), a plan of phased retreat for Nauset Beach that included dune enhancement was recommended to protect valuable resources and extend the lifetime of the public beach. Beneficial reuse of sediment dredged from Nauset Estuary for dune enhancement at the public beach would result in a significant cost savings for the Town as the plan of phased retreat for Nauset Beach is implemented.

The most efficient method to use this site would be to contract with the Barnstable County dredge and hydraulically pump the sediment from the estuary directly to Nauset Beach. Because the beach is approximately one mile to the closest part of the estuary, it would be necessary to incorporate use of a booster pump to transport the material. The maximum pump distance for the County dredge with a booster pump is 11,000 ft. This distance would allow portions of Nauset estuary to be hydraulically dredged and the material directly pumped to Nauset Beach, but the ends of the dredge project near the inlet and towards Town Cove would still be too far (Figure 23). Dredge volume estimates from this section of the channel that could be pumped to Nauset Beach are approximately 45,100 cubic yards (channel area 1 in left panel of Figure 23).

It is estimated that Nauset Beach could hold approximately 80,000 cubic yards, and would likely be available for reuse as a placement site within 5 to 10 years if the estuary required maintenance dredging. A preliminary compatibility assessment indicates that the Nauset Estuary sediments have a median grain size between 0.2 and 0.6 mm (fine to coarse sand) and would therefore be suitable for use as dune enhancement at Nauset Beach.

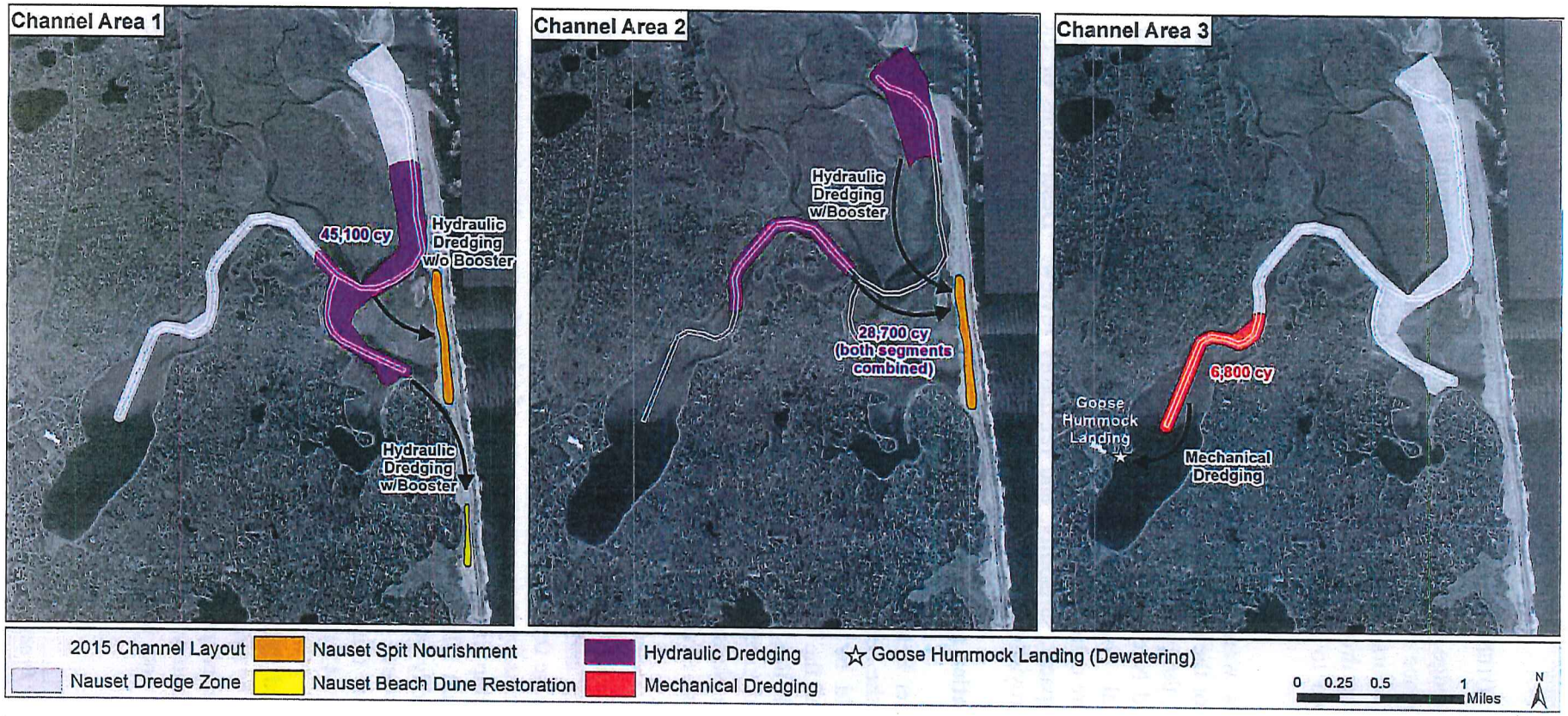

Figure 23. Dredging and placement options for Nauset Estuary.

Dune enhancement along Nauset Spit

The Town-owned portion of Nauset Spit could also be used as a placement site, and could accommodate material acquired through hydraulic dredging. Because of its proximity to the estuary, a good portion of the channel could actually be dredged and the material transported to Nauset Spit without a booster. The left panel of Figure 23 shows approximately 45,100 cubic yards from channel area 1 could be placed on Nauset Spit without the use of a booster pump. With the notable exception of the last mile of channel leading to Town Cove, the remaining portions of the channel would be within reach of Nauset Spit using a hydraulic cutterhead dredge equipped with a booster pump. Approximately 28,700 cubic yards of sand from channel area 2 could be used to enhance Nauset Spit if a booster pump is utilized (channel area 2 in center panel of Figure 23).

Capacity of this site is estimated at more than 100,000 cubic yards, and the site would likely be available for reuse as a placement site within 5 to 10 years. As with the Nauset Beach site, the dredged sediments would be compatible with existing material at Nauset Spit.

Upland/coastal beneficial reuse

There is also the option to beneficially reuse the dredged material at an upland site, or at a site farther away than a hydraulic dredge can pump the material. This option would likely require mechanical dredging with temporary storage, dewatering, and trucking of the dredged material. However, because there is very little upland open space around the estuary, options for dewatering locations are limited. This method is less efficient than hydraulic dredging and would only be recommended for the furthest upstream portion of the channel leading to Town Cove, where even hydraulic methods with the Barnstable County dredge are not feasible. This section of the channel currently requires dredging of approximately 6,800 cubic yards (channel area 3 in right panel of Figure 23).

One potential shorefront staging area in Town Cove is Goose Hummock Landing (Figure 23). In this scenario the material would be mechanically dredged and transported via small barge to Goose Hummock Landing. The sediment would be partially or totally dewatered in the barge (depending on the grain size), and then off loaded at the public bulkhead where it would be temporarily stored for further dewatering (if necessary) and then trucked to a pre-selected beneficial reuse site.

Subaqueous placement

An interesting option that might be considered is to spread sandy dredge material over the surface of the salt ponds, thereby burying the *Alexandrium* cysts that are present in these areas. Calculations performed as part of this study suggest that the dredged sediments will contain very few *Alexandrium* cysts (see Section 4.2 below). If a layer only a few cm thick were dispersed in this manner, and if this were done in the late winter, just before the time when the cysts begin germinating, the inoculum for that year's bloom could be substantially reduced. Not only will sediments quickly become anoxic below

the sand layer, inhibiting germination, but the sand grains would make it very difficult for any germinated cells to successfully swim to the overlying water column.

This placement alternative would accommodate only a small fraction of the dredged material and should be considered experimental at this point. Further discussion with the stakeholders and regulatory officials would be required to evaluate the methods, sites, and potential benefits.

Marsh restoration

A second interesting option for beneficial reuse of dredged material would be to place the sediment in a thin layer over portions of the salt marsh to allow the marsh to keep pace with rising sea levels. This too should be considered experimental, since further data would be needed investigate response of the Nauset Estuary marshes to sea-level rise to see if the alternative is warranted. Additional discussions with the CCNS would be required since the large marsh areas in the estuary are owned by the National Park Service (NPS). The enacting legislation for the CCNS appears to prohibit this type of activity on the salt marsh; however, similar projects under consideration elsewhere may help to demonstrate important benefits of this approach that may allow its use.

4.0 PROJECT FEASIBILITY

The feasibility of establishing a dredging program in Nauset Estuary is described in the following sections in terms of potential environmental impacts, engineering constraints, regulatory requirements, and construction costs.

4.1 ENVIRONMENTAL FEASIBILITY

A dredging program in Nauset Estuary has the potential to have both positive and negative impacts. If the Town decides to pursue the project further it will be necessary to conduct more in-depth environmental impact analyses than were achievable with resources available for this study. However, data and tools developed for this project were used to the extent possible to evaluate potential impacts of the project.

Impacts on hydrodynamics

The FVCOM model described on Section 2.3 was used to evaluate potential changes to the estuary hydrodynamics caused by the dredge plan. The model grid was updated to reflect the 100 ft wide channel dredged to a depth of -5 ft MLLW (Figure 24). To allow comparison with previously validated model results, the model simulations were forced with conditions corresponding to a previous observational period in April 2011.

One of the more notable differences between model simulations with the current 2015 bathymetry and the proposed dredged channel was an increase in tidal amplitude. As the channel has shoaled in recent years and the inlet location has migrated to the north, the channel has become shallower and longer, and therefore more frictional. The added bottom friction causes a reduction in the amplitude of the tide propagating into the estuary from the ocean. Measured water level data from moorings deployed in Town Cove at various times since spring 2009 demonstrate that the tidal amplitude has been

decreasing as the channel has lengthened and the friction increased (Figure 25). The data show a 20% decrease in tidal amplitude over the 5 year period of observation. A similar decrease in water level was observed in measurements from Salt Pond.

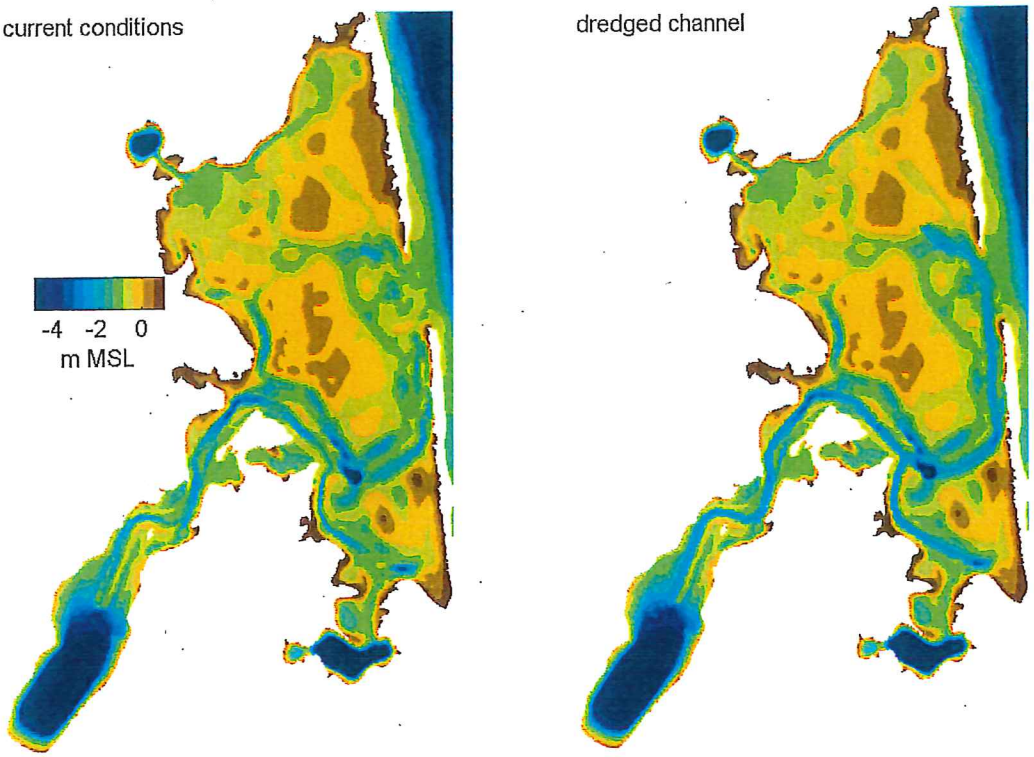

Figure 24. Model bathymetry based on (left) 2015 bathymetric soundings, and (right) channel dredged to -5 feet MLLW.

Model simulations are generally consistent with the observed trends. For example, simulations with the current 2015 bathymetry have a lower tidal amplitude in Town Cove (and the other ponds) than the previous model simulations based on bathymetry surveys through 2009 (Figure 25). In the model, the effect of dredging is to make the tidal flow less frictional, increasing conveyance into the ponds and increasing the tidal amplitude. Therefore, expected effects of the dredging are to restore tidal amplitude to values similar to the model results using the older bathymetry and the observations from 2009-2011.

In the model, tidal velocities and bottom stresses increase modestly in the vicinity of the proposed dredging (Figure 26). The changes in bottom stress, which are important for determining sediment transport, are due both to the increase in water depth and the increase in tidal amplitude. The estuary remains strongly flood dominant, continuing to favor sediment import and accretion. Bed stresses with the proposed dredging are greater in the current configuration only in a few locations, which likely correspond with regions that are currently depositional. In general, the dredging project is not expected to result in increased shoreline erosion within the estuary as the system is expected to return to conditions that existed previously. Longer term, shifts in tidal amplitude, bottom stress,

and sediment transport depend as much on inlet position and dynamics as on the channel depth.

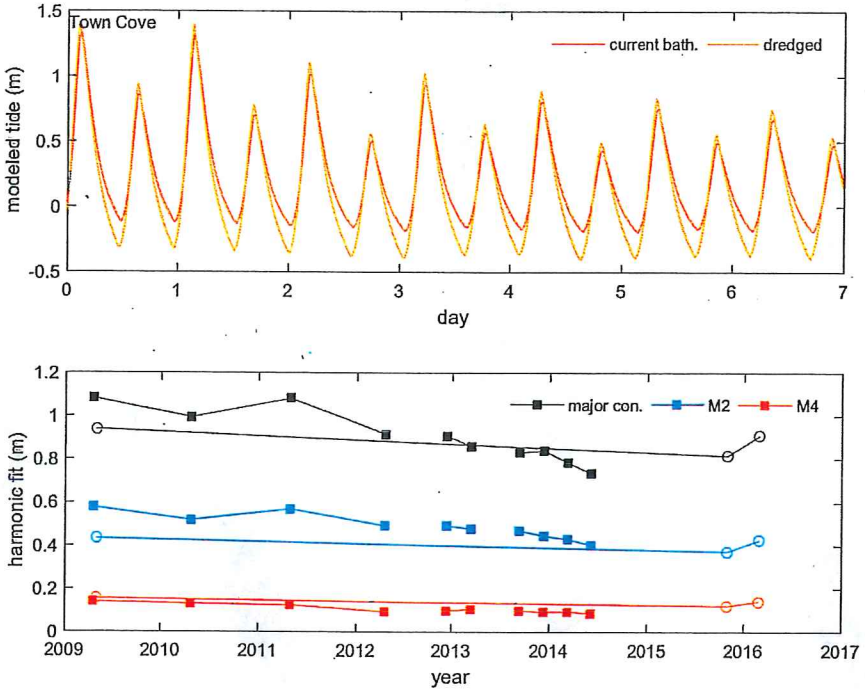

Figure 25. **Modeled and observed tidal amplitudes in Town Cove. (top) Modeled water level using 2015 bathymetry vs. the dredge configuration. (bottom) Tidal harmonics based on observations (filled squares) and model results (open circles). Model results are based on simulations using bathymetry from 2009, 2015, and the dredged channel.**

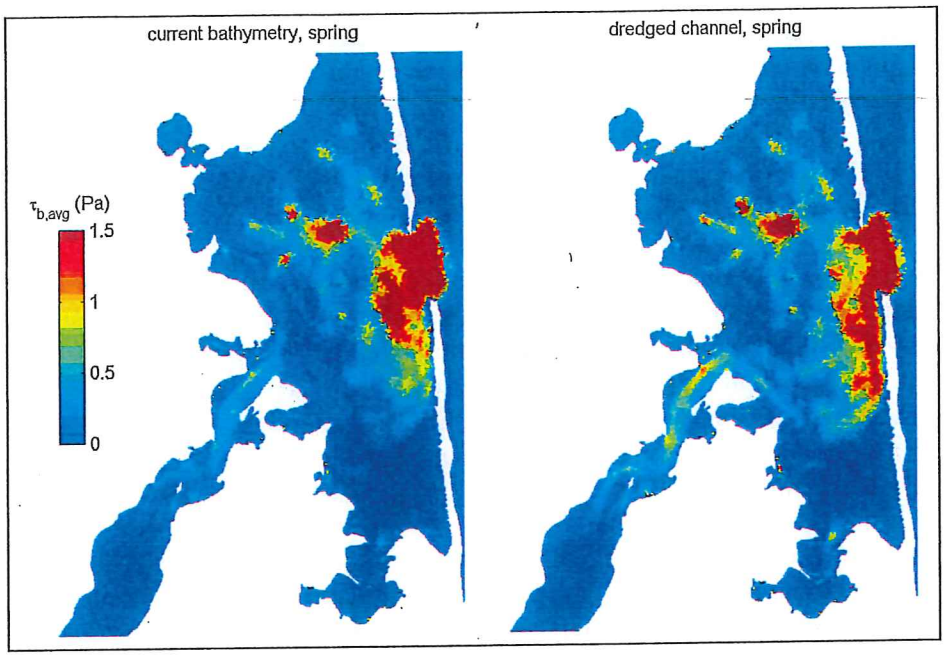

Figure 26. Modeled bottom stresses (average over 2 days) for the current bathymetry (left) and bathymetry with the proposed channel (right).

Impacts on distribution of red tide cysts

There are several ways that the dredging might alter the dynamics and distributions of *Alexandrium* blooms within Nauset Estuary. One is that the mechanical or hydraulic dredging operations will resuspend sediments that contain *Alexandrium* cysts, redistributing those cysts within the marsh, and, depending on the timing of the dredging, provide conditions that are suitable for germination. The latter concern can be eliminated by dredging between December and February when the cysts are generally incapable of germination.

The redistribution of cysts in also not a major concern based on the following reasoning. The estuary is strongly flood dominant and retentive, so resuspended sediment and cysts will likely deposit within the estuary, either on the marsh platform or in regions of lower velocity like shoals at the channel edges or in the salt ponds. It is, however, not possible to estimate the total number of cysts that will be resuspended during dredging, as this will not be constant across the marsh due to variable cyst abundances and sediment types in the areas to be dredged. Previous coring data have shown that cysts are most concentrated in the top few cm of the bed, and that concentrations decrease rapidly within about 10 cm from the surface. The dredging depth would generally be much deeper than 10 cm, and thus the cysts in the surface layer will be mixed and diluted with the deeper bed material. The calculation described in Section 2.6 estimated an average of 40 cyst/ cm^3 in the dredged material, and it is reasonable to assume that the sediment and cysts released to the environment during dredging will have a similar average concentration. Resuspension experiments in test plots in Roberts Cove found that cysts settled at rates similar to silt-sized sediment (Anderson and Ralston, unpublished data), so the cysts and silt can be expected to be transported in the estuary similarly. Silt is most commonly

found in the lower energy regions of the system, including the salt ponds and shallow side embayments, and in these regions the background cyst concentrations range from several hundred to several thousand cysts/cm^3. The addition of newly remobilized material with an average concentration of around 40 cyst/cm^3 would not increase the cyst abundance at the bed surface in these depositional areas, nor would it be expected to increase the magnitude of *Alexandrium* blooms.

Alternatively, the total number of cysts in the dredge material is estimated to be 2.2 x 10^{12}. Using a similar approach, the total number of cysts in the estuary in the top 1 cm of the bed is estimated to be 6.6 x 10^{13}, and the total number in the top 10 cm of the bed as 3.3 x 10^{14}. Estimating that the loss rate of resuspended material during dredging operations to be 1% (Palermo, et al., 2008), the total number of cysts released during dredging would represent an addition of about 0.03% to the cysts in the surface layer. Again, this would not be expected to increase the magnitude of *Alexandrium* blooms.

The changes in tidal amplitude in the estuary associated with dredging that were calculated by the model may have impacts on red tide cysts that are difficult to quantify. An increase in tidal range could enhance flushing of the salt ponds, potentially reducing the accumulation rates of *Alexandrium* cells in the ponds and bloom intensity (Ralston et al. 2015). Larger tides may also increase bed stresses in the system, remobilizing and redistributing fine sediment and associated cysts. This could increase the population of cysts that are available to germinate, although as with the sediment released during dredging operations, the expectation is that the fine sediment and cysts would accumulate in regions that already have high cyst concentrations. An important point in assessing potential effects of a change in tidal amplitude is that the model predicts a return to tidal conditions similar to that of several years ago rather than a significant increase over the historical range. As the Nauset inlet has migrated north and the entrance channel both extended and shoaled, the estuary has become more frictional, accounting for the decrease in tidal range. The proposed dredging would reverse some of that decrease, but the tidal regime and any effects on the harmful algal bloom would be similar to conditions from a few years ago.

Red tide impacts associated with the various placement alternatives shown in Figure 23 present no major concerns or negative impacts. For the dune enhancement alternatives, most cysts in the sand will be buried in the dune, such that few, if any, will be washed back into the water. As the sand dries out, the cysts will desiccate and die. With the upland/coastal beneficial reuse alternative the primary concern with respect to *Alexandrium* cysts is that during the dewatering process, cysts might be carried into Town Cove with the water that drains from the sediment pile. But, sand and silt act as filters when piled in the holding area, so most cysts will be strained from the water as it drains through the tortuous path of the sand, silt, and clay particles. With the marsh restoration option, the dredged sediment and associated *Alexandrium* cysts will be trapped by the *Spartina* and other marsh grasses. The cysts will thus be placed in an environment where they are likely either to die, due to repeated cycles of inundation and drying with the tides, or to be buried into anoxic sublayers of sediment, where they will remain dormant until they die. The subaqueous placement alternative has considerable promise to be effective and

environmentally benign, but it should be pursued as a pilot research study first to demonstrate the principle of using sand deposition to suppress cyst germination.

Impacts requiring further study

Given that FVCOM shows changes in tidal amplitude with the dredging project, it is likely that the project would also result in changes to tidal flushing and water quality. However, these impacts are not expected to result in significant harm since the system will be returning to conditions that existed previously. If the Town proceeds with the project it will be important to quantify these potential impacts. In terms of sediment transport and shoreline erosion, the dredging is not expected to result in significant differences. However, one area that requires further examination is the southern channel leading to Priscilla Road Landing. While the FVCOM model does not indicate significant changes to hydrodynamics in this area caused by dredging, the potential for an increased risk of breaching at the historical 1930's location near Nauset Heights should be evaluated further. If adverse impacts are noted, it may be possible to evaluate different dredging scenarios (narrower, shallower) that would reduce the potential for a breach in this location. If the Town proceeds with the project, it will also be necessary to evaluate potential impacts to existing resources such as shellfish, wetlands, shorebirds, etc. through more detailed surveys.

4.2 ENGINEERING FEASIBILITY

The engineering feasibility of the project was evaluated by looking at two primary aspects of the project. The first was the ability to maintain a dredged channel to the desired width and depth without frequent maintenance dredging. The second included an evaluation of viable construction methods given the dredge channel layout and available placement options. Although determining specific time frames for the former is difficult, based on preliminary hydrodynamic modeling and long-term knowledge of the geomorphology of Nauset Inlet and Nauset Estuary, rough projections of the lifetime of the dredged channel can be made. Because of the dynamic nature of the inlet and barrier beach, the portion of the channel immediately behind the barrier beach and near the inlet would likely require maintenance dredging every 1 to 3 years to maintain the channel design. In the event that a new breach forms to the south near Tern Island, the channel area behind the barrier beach would be abandoned, and maintenance dredging would only be required in the channel leading to the breach. Post-dredge shoaling rates in the interior channels are difficult to predict without a detailed sediment transport model; however, it is likely that these areas would receive small volumes of sedimentation and would require infrequent maintenance dredging.

The second engineering consideration involves which construction methods are viable given the channel layout, available placement options, and equipment limitations. Because there are technical limitations to how far dredged material can be hydraulically pumped, the limits on appropriate placement sites were assumed to the 4,000 and 11,000 ft from the dredge locations. These two distances coincide with the Barnstable County Dredge capabilities to pump dredge material without and with a booster pump. Because Nauset Beach is approximately one mile south of Nauset Estuary, material can only be hydraulically pumped there with a booster pump attached to

the pipe (Figure 23). Alternatively, Nauset Spit is much closer to the proposed dredge areas, and could be used as a placement site for material pumped from within 4,000 feet using a hydraulic dredge, even without a booster. By adding a booster pump, material from much of the proposed dredge area could be pumped to this location.

Finally, due to the length of the dredging project, areas of the channel in the vicinity of Town Cove are more than 11,000 feet from either beach/dune disposal site. As such, the distance limitations of the County Dredge, even with an attached booster pump, rule out the possibility of utilizing a hydraulic dredge to remove the material from this portion of the channel (Figure 23, right panel). Instead, the material will need to be mechanically dredged, and barged to a shorefront location for offloading and trucking to an approved site. Water depths in the estuary would not allow for a fully loaded barge to be towed to the eastern side of the system so the material could be used on Nauset Spit. Instead, the likely destination for any mechanically dredged material, regardless of grain size, from the Town Cove portion of the channel would be Goose Hummock Landing. There, it could be offloaded at the existing bulkhead, dewatered in the parking lot if necessary, and then trucked to Nauset Beach for dune enhancement or some other approved location.

4.3 REGULATORY FEASIBILITY

Any dredging project in Massachusetts requires certain permits and certificates. Based on the 2015 channel layout, which includes removal of approximately 80,600 cubic yards of sediment from over 79 acres, regulatory review will be required by the Massachusetts Environmental Protection Act (MEPA) and the Cape Cod Commission in the form of an Environmental Impact Report (EIR) and District of Regional Impact (DRI). The current plan exceeds the regulatory threshold for the EIR, which is alteration of ten or more acres of a wetland (11.03(3)(a)1a). It may be possible to file an Expanded Environmental Notification Form (ENF) with MEPA requesting a waiver from the requirements of an EIR. This would reduce permitting costs and timing, but at this point it is unclear if MEPA would accept this request. It may also be possible to scale the project back so the EIR threshold is not triggered, but this would require a significant reduction in project scope which may not meet the objectives of improving navigation and public safety.

Since the channel layout includes sections in both the Town of Orleans and the Town of Eastham, a separate Notice of Intent will need to be filed with each town's Conservation Commission. In addition, other standard permits for dredge projects, such as a Massachusetts DEP Water Quality Certification, Chapter 91 Permit, Coastal Zone Consistency, and a USACE Individual Permit will also be required.

Although certain activities are prohibited or more strictly regulated within the Cape Cod National Seashore (CCNS), this dredge plan would not require additional federal permitting because of its location within the CCNS. However, close communication with the CCNS will be important if the project proceeds. Placement options on Town owned land, shown in Figure 23 in Section 3, also do not trigger the need for permitting with the CCNS.

Table 3 summarizes the list of permits that would be required to implement the dredge plan. The table details the type of application, agency responsible for issuing each

permit, the duration of the permits, and the estimated cost associated with preparing and applying for each permit. Combined, the cost for all permits necessary for this project is estimated to be approximately $141,000. If the requirement for an EIR/DRI can be waived the cost for permitting could be reduced to approximately $75,400. Although an exact time line for applying for and receiving all the permits is not possible to develop at this time, it is likely to take between 2 and 3 years.

This feasibility study collected a limited amount of data, to help evaluate the feasibility of the project, but more detailed data will be required for actual permitting. Based on past experience from similar projects, a list of additional data needed to support the permit applications has been developed and is summarized along with associated costs in Table 4. To complete all the additional data collection would cost approximately $195,900 and would take approximately 1 year to complete.

Combined the cost of permitting and additional data collection would range between $271,300 and $336,900 depending on whether or not an EIR/DRI review is required.

Table 3. Required permits for the Nauset Estuary dredge project.

Application	Agency	Permit Duration	Cost
Expanded Environmental Notification Form	MEPA	Not Applicable	$17,400
Environmental Impact Report/ Development of Regional Impact Joint Filing	MEPA/ Cape Cod Commission	Not Applicable	$65,600
Notice of Intent	Orleans Conservation Commission	3-Years, possibly up to 10-Years	$15,000
Notice of Intent	Eastham Conservation Commission	3-Years, possibly up to 10-Years	$15,000
401 Water Quality Certification	MADEP Wetlands & Waterways	5-Years	$8,000
Chapter 91 Waterways Permit	MADEP/ Waterways	10-Years	$8,000
MCZM Federal Consistency Determination	MA Coastal Zone Management	Not Applicable	$5,000
MA Individual Permit	Army Corps of Engineers	10-Years	$7,000

Table 4. Data collection activities and estimated costs to support permit applications.

Data Collection Activity	Estimated Cost
Resource area surveys (wetlands, shellfish, eelgrass, shorebirds)	$23,000
Beach and dune topographic surveys	$7,800
Bathymetric surveys (Pre- and Post-Dredge)	$18,400
Placement site Monitoring	$9,100
Vibracoring and beach sampling for grain size	$42,500
Refined hydrodynamic modeling	$77,700
Engineering design and plans	$17,400
Total	**$195,900**

4.4 CONSTRUCTION COSTS

Construction costs are contingent on a number of factors, including mobilization costs, dredging costs, disposal costs (in the case of mechanical dredge), and whether or not a booster is utilized (in the case of hydraulic dredging). Mobilization costs to get the County Dredge to Nauset Estuary are approximately $25,000 per dredge event. The cost for actual dredging, however, depends on whether a booster pump is utilized. Without a booster pump, dredging costs $9 per cubic yard. With a booster pump, dredging costs $13 per cubic yard. There are no specific disposal costs associated with hydraulic dredging because the material is pumped to the placement site as it is being dredged, although some land-based, mechanical equipment such as bobcats and bulldozers may be required to spread and grade the material, which would add additional costs to this method.

Mechanical dredging is more costly. The mobilization cost for a mechanical dredge is approximately $150,000. The cost of actual dredging is $43 per cubic yard. Unlike hydraulic dredging, the mechanical dredging would also incur a rehandling and trucking fee of approximately $43 per cubic yard. If the material was not reused beneficially, and taken to a landfill for use as daily cover there would also be a tipping fee of about $37 per cubic yard.

Given the volumes of sediment present in different areas of the channel layout (Figure 22), and the limitations of what dredge method and placement site can be utilized for each of the areas (Figure 23), the cost of dredging each channel area has been calculated (Table 5). Assuming that the entire 80,600 cubic yards of material is dredged from all three channel areas in Nauset Estuary, the costs would range between $1.5 and $1.7 million. If sediment dredged from channel areas 1 and 3 (Figure 23) is used beneficially for dune restoration at Nauset Beach, it could save the Town between $900,000 and $1,200,000, which is the estimated cost for purchasing and spreading sand to restore the dune (Woods Hole Group, 2016).

Table 5. Estimated construction costs for dredging Nauset Estuary.

Dredge Method	Channel Area 1[1]	Channel Area 2[1]	Channel Area 3
Hydraulic w/o Booster	$430,900		
Hydraulic w/ Booster	$611,300	$398,100	
Mechanical			$734,800

1: Includes $25,000 mobilization/demobilization fee

All mechanical (remove sand to another location)

80,600 cy x $43
3,465,800
+ 150,000 mob
3,615,800

Ch Area 1 – sand to Nauset Beach 611,300.

4.5 SUMMARY OF FEASIBILITY FACTORS

Sections 4.1 to 4.4 describe the various feasibility considerations for the Nauset Estuary dredging project. These considerations encompass environmental, engineering, regulatory, and financial concerns involved with this project. To better facilitate an understanding of all these project components, the major findings from each feasibility category are summarized below in Table 6. The Town can use this summary, as well as the detailed information presented in this report, to determine the overall feasibility of this project, based on their needs, available funding, and required time frames.

Table 6. Summary of project feasibility.

Feasibility Category	Summary
Environmental	• No adverse impacts are expected due to dredging in areas with red tide cysts provided the work is done between December and February. • Potential impacts to shellfish and water quality will require further study to be determined. • Because no eelgrass is present in Nauset Estuary, no impacts are expected to this resource.
Engineering	• Combination of hydraulic and mechanical dredging • Placement can be through nearby beneficial reuse and offsite upland transport • Lifetime estimates for the dredged areas range from a low of 1 to 3 years immediately behind the barrier beach to higher lifetimes with infrequent maintenance dredging elsewhere.
Regulatory Constraints	• The total cost to complete all necessary additional data collection and prepare and submit all required permits is estimated to be $336,900. • It will take approximately 1 year to complete all additional necessary data collection, and an additional 2 to 3 years to apply for and acquire all permits necessary to commence work
Construction Costs	• Construction cost for the entire project range from $1.5 to $1.7 million. If sand used to build up spit – if all mechanical ↑ up to 3.6! • Beneficial reuse of the dredged sand could offset the costs of dune enhancement and phased retreat at Nauset Beach by approximately $900,000 to $1,200,000.

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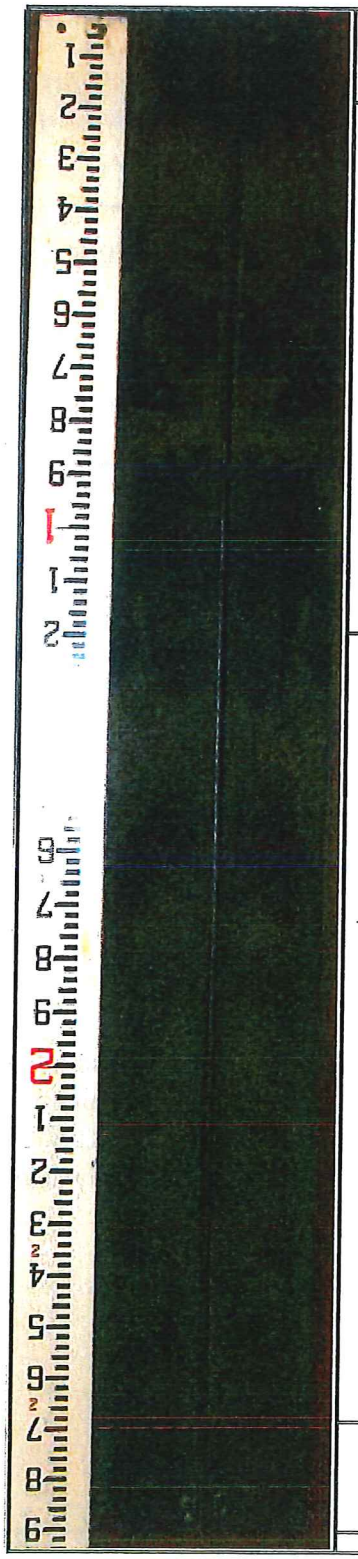
APPENDIX A. CORE LOG DESCRIPTIONS

Sediment Core Descriptions

N-1

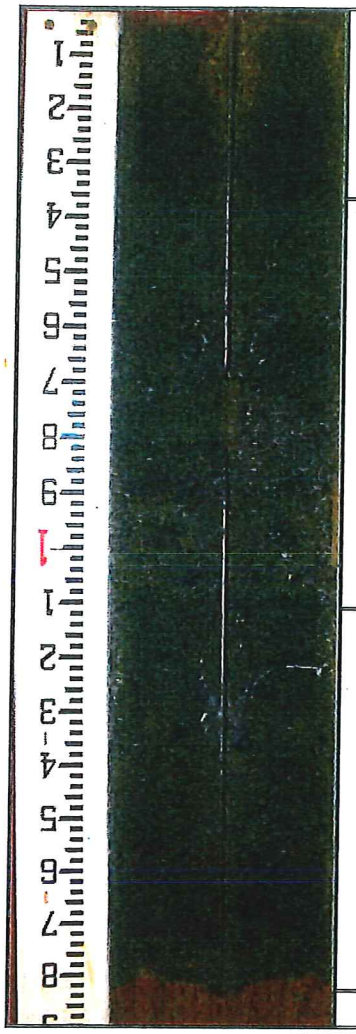


0.0-0.2’	Black sandy silt. Well sorted.
0.2-1.2’	Fine sand. Moderately-well to well-sorted. Color modeled brown to gray.
1.2-2.7’	Medium to fine sand. Moderately well-sorted. Gray.
2.7-2.9’	Fine sand. Moderately to well sorted.

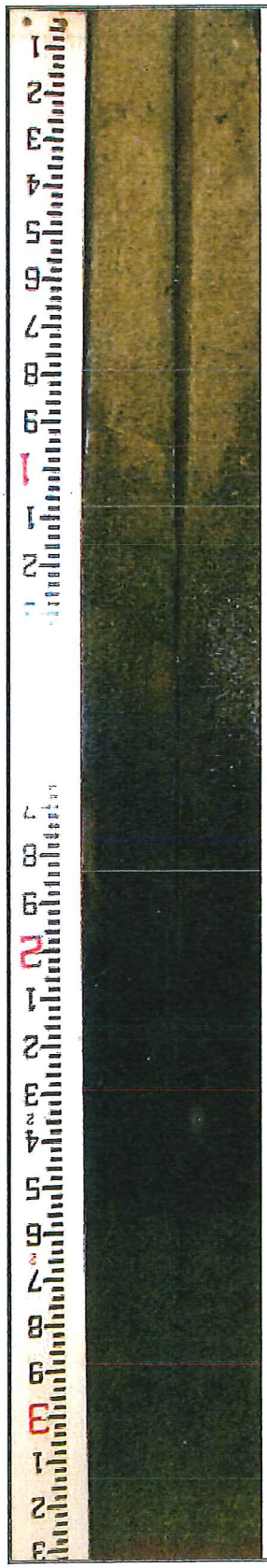
N-2

0.0-0.4’	Medium to fine sand. Silty clay clast. Slipper snail shell on surface. Variable color. Modeled brown to black.
0.4-0.86’	Fine sand. Occasional shell fragments. Well-sorted. Color is gray/light gray.
0.86-0.88’	Silt. Gray to dark gray. Crushed shell hash on top layer then silt.
0.88-1.08’	Fine to medium sand. Light brown to gray color. Moderately well sorted
1.08-1.16’	Sandy silt. Gray to dark gray. Well sorted.
1.16-2.78’	Sand. Grain-size coarsens with depth. Medium grained with occasional pockets of coarser sand. Organic material at 2.32’. Crushed shell hash at 2.6-2.62’. Silt content at 2.06-2.22’. Light gray to gray color.

N-3

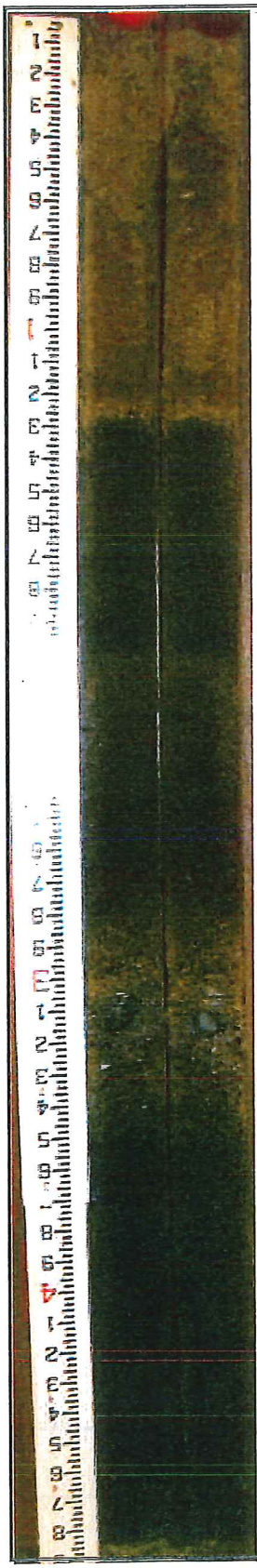


0.0-0.36’	Medium to fine sand. Moderately sorted. Dark gray to dark olive gray.
0.36-1.1’	Sand. Poorly sorted. Fine to coarse sand. Small percentage gravel. Small to coarse gravel size. Organic content includes charcoal, woody debris and shell hash. Color variable light brown to gray.
1.1-1.86’	Medium to fine sand. Moderately sorted. Gray to dark gray.



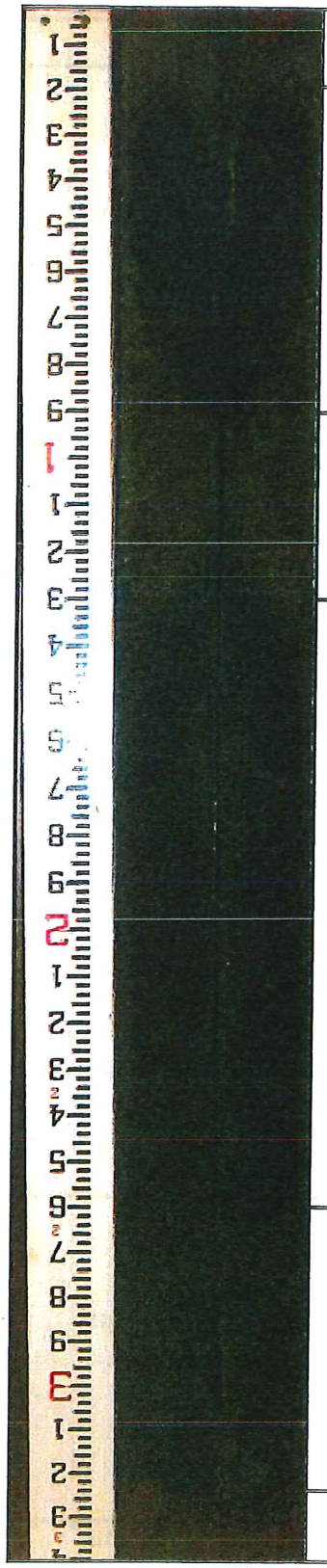
0.0-1.2’	Sand. Poorly sorted. Medium grained matrix with gravel. Light brown color.
1.2-1.6’	Top predominately quartz. Slightly coarser grained. Minerology is different. High content of darker sand grains.
1.6-1.98’	Gray to dark gray. Moderately well sorted.
1.98-2.2’	Well sorted. Fine sand. Very dark gray. Shell fragments. Occasional large gravel.
2.2-2.56’	Bimodal sand. Dark gray.
2.56-3.3’	Medium to coarse grained with gravel. Salt and pepper color. Predominately quartz. Medium to poorly sorted.

N-5



0.0-1.26’	Medium grained sand. Moderately sorted. Shell fragments. Low percentage gravel. Brown to light browns.
1.26-2.84’	Well sorted medium sand. Color variable light gray to dark gray.
2.84-3.52’	Well sorted medium sand. Color variable light gray to dark gray.
3.52-4.56’	Moderately sorted. Medium grained sand matrix. Occasional gravel. Color gray to dark gray.
4.56-4.84’	Poorly sorted sand with low percentage silt and gravel. High percentage organic material with shell hash. Gravel > 1 cm well rounded. Black color.

N-6



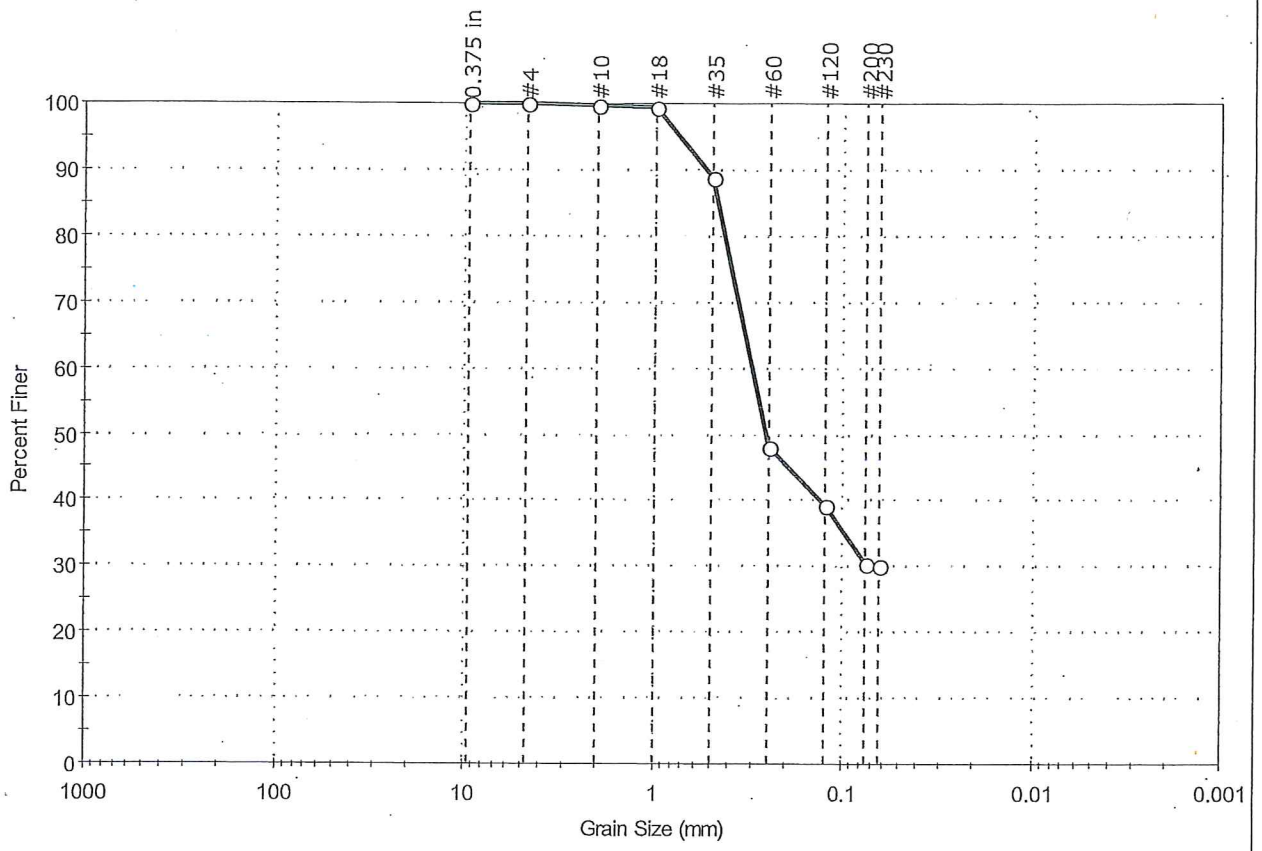
0.0-0.2’	Fine to medium sand with gravel. Light brown.
0.2-0.9’	Uniform texture. Fine sand and silt content. Bottom on transition zone on an angle. Sand content increases with depth. Dark olive gray to black.
0.9-1.3’	Moderate medium grained sand. Low percentage gravel fragments. Color light grayish to brown.
1.3-2.6’	Fine to medium grained sand. Well rounded gravel. Gray to dark gray. Well sorted.
2.6-3.24’	Medium grained. Slightly coarser than above. Moderately sorted. Gray.

APPENDIX B. LABORATORY GRAIN SIZE RESULTS

GeoTesting EXPRESS

Client:	Woods Hole Group				
Project:	Orleans Nauset Estuary				
Location:	Nauset Inlet, MA			Project No:	GTX-304172
Boring ID:	2015-0121	Sample Type:	bag	Tested By:	jbr
Sample ID:	N-1	Test Date:	01/04/16	Checked By:	emm
Depth :	0-0.2 ft	Test Id:	359153		
Test Comment:	---				
Visual Description:	Moist, olive silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.1	69.5	30.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#18	1.00	99		
#35	0.50	89		
#60	0.25	48		
#120	0.12	39		
#200	0.075	30		
#230	0.063	30		

Coefficients

D_{85} = 0.4690 mm D_{30} = N/A
D_{60} = 0.3059 mm D_{15} = N/A
D_{50} = 0.2579 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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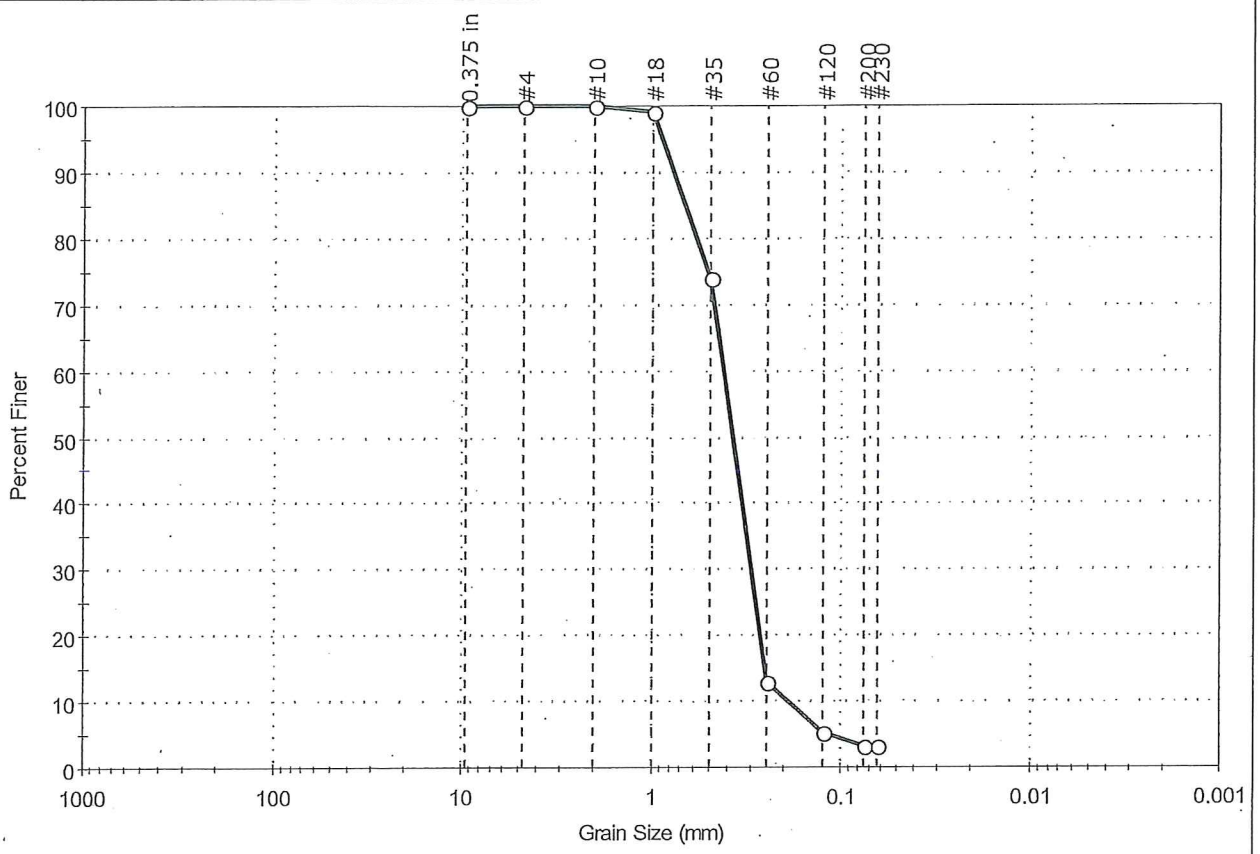
GeoTesting EXPRESS

Client:	Woods Hole Group				
Project:	Orleans Nauset Estuary				
Location:	Nauset Inlet, MA			Project No:	GTX-304172
Boring ID:	2015-0121	Sample Type:	bag	Tested By:	jbr
Sample ID:	N-1	Test Date:	01/04/16	Checked By:	emm
Depth :	0.2-2.3 ft	Test Id:	359154		
Test Comment:	---				
Visual Description:	Moist, gray sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	96.8	3.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#18	1.00	99		
#35	0.50	74		
#60	0.25	13		
#120	0.12	5		
#200	0.075	3.2		
#230	0.063	3		

Coefficients

D_{85} =0.6765 mm	D_{30} =0.3031 mm
D_{60} =0.4262 mm	D_{15} =0.2556 mm
D_{50} =0.3804 mm	D_{10} =0.1901 mm
C_u =2.242	C_c =1.134

Classification

ASTM Poorly graded sand (SP)

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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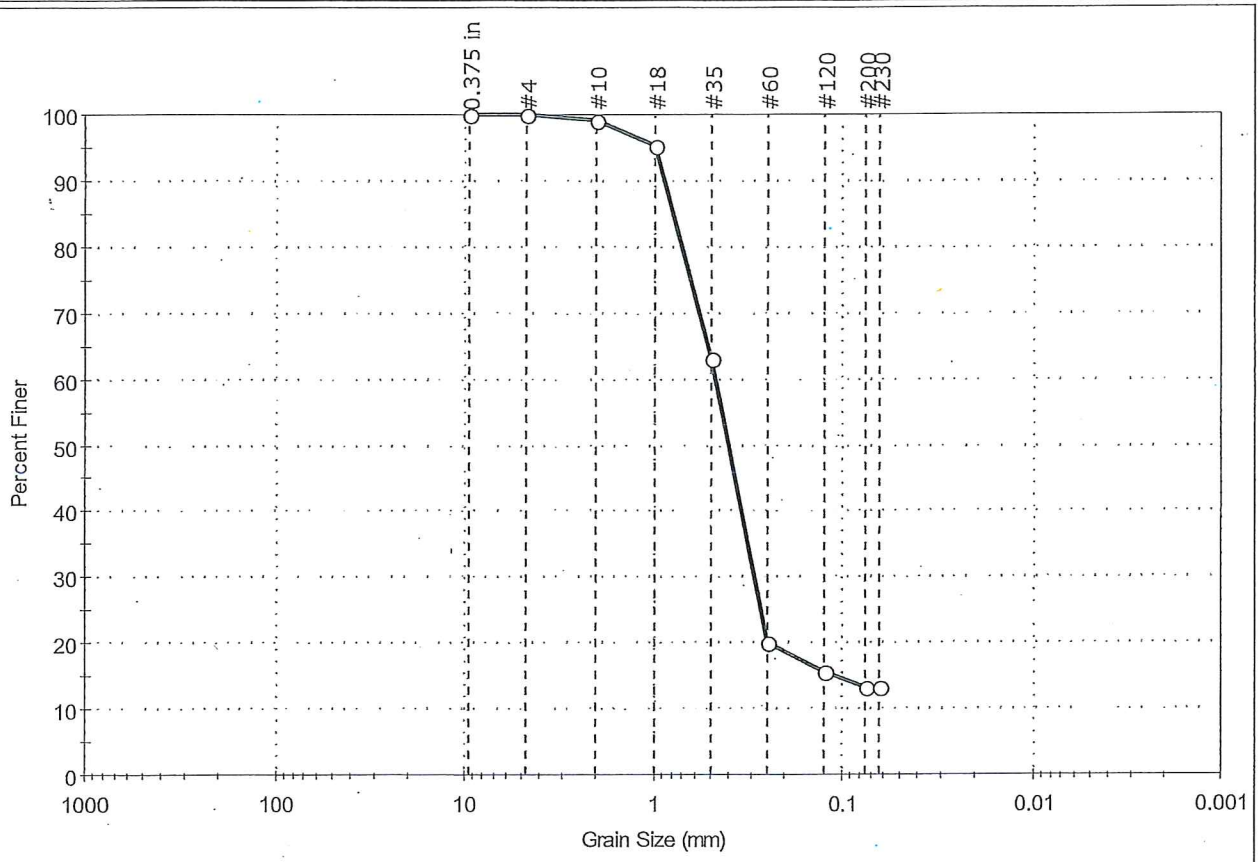
Client:	Woods Hole Group				
Project:	Orleans Nauset Estuary				
Location:	Nauset Inlet, MA			Project No:	GTX-304172
Boring ID:	2015-0121	Sample Type:	bag	Tested By:	jbr
Sample ID:	N-2	Test Date:	12/31/15	Checked By:	emm
Depth :	0-2.6 ft	Test Id:	359155		
Test Comment:	---				
Visual Description:	Moist, olive silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	86.7	13.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	99		
#18	1.00	95		
#35	0.50	63		
#60	0.25	20		
#120	0.12	16		
#200	0.075	13		
#230	0.063	13		

Coefficients

D_{85} = 0.8010 mm D_{30} = 0.2935 mm
D_{60} = 0.4765 mm D_{15} = 0.1095 mm
D_{50} = 0.4054 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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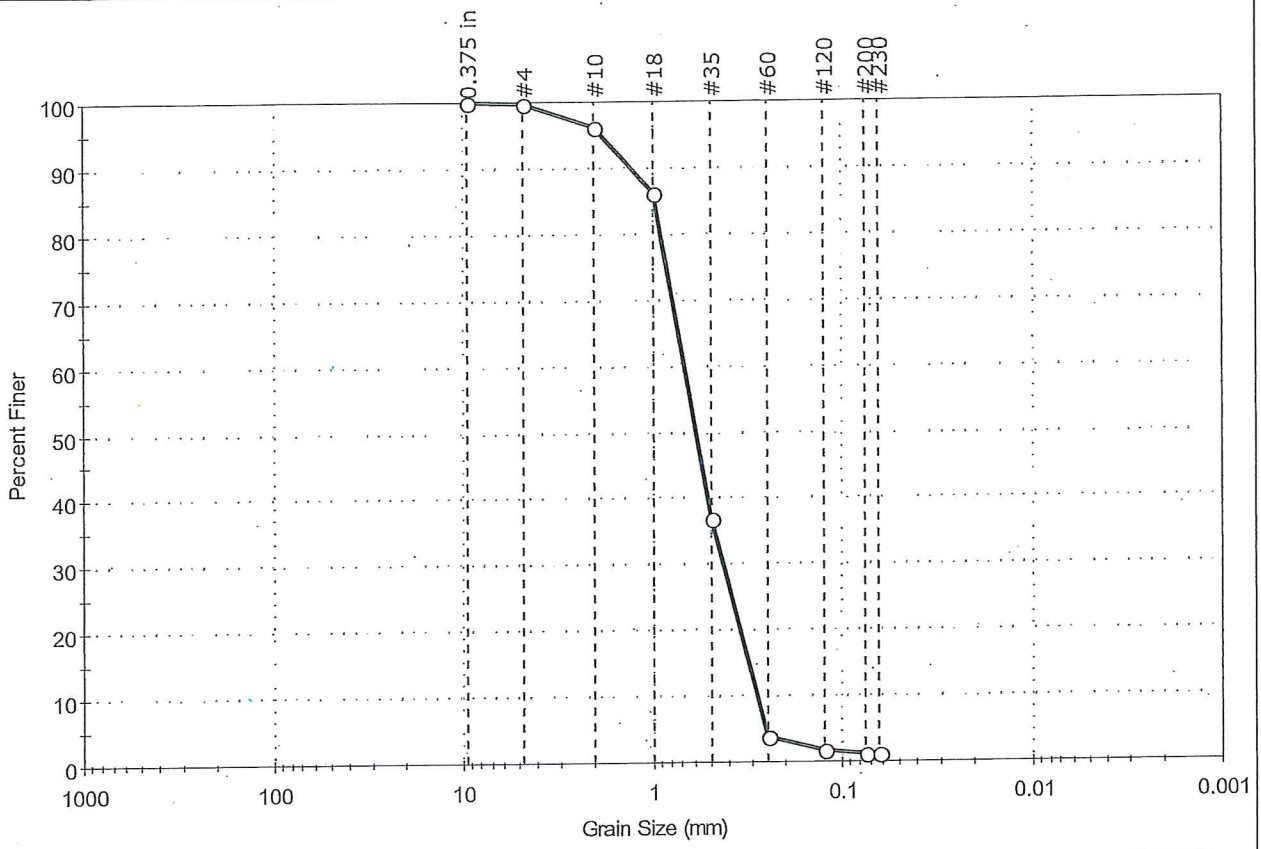
GeoTesting EXPRESS

Client:	Woods Hole Group				
Project:	Orleans Nauset Estuary				
Location:	Nauset Inlet, MA			Project No:	GTX-304172
Boring ID:	2015-0121	Sample Type:	bag	Tested By:	jbr
Sample ID:	N-3	Test Date:	12/31/15	Checked By:	emm
Depth :	0-1.8 ft	Test Id:	359156		
Test Comment:	---				
Visual Description:	Moist, pale brown sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.4	98.3	1.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	96		
#18	1.00	86		
#35	0.50	37		
#60	0.25	4		
#120	0.12	2		
#200	0.075	1.3		
#230	0.063	1		

Coefficients

D_{85} =0.9840 mm	D_{30} =0.4324 mm
D_{60} =0.6918 mm	D_{15} =0.3163 mm
D_{50} =0.6009 mm	D_{10} =0.2850 mm
C_u =2.427	C_c =0.948

Classification

ASTM Poorly graded sand (SP)

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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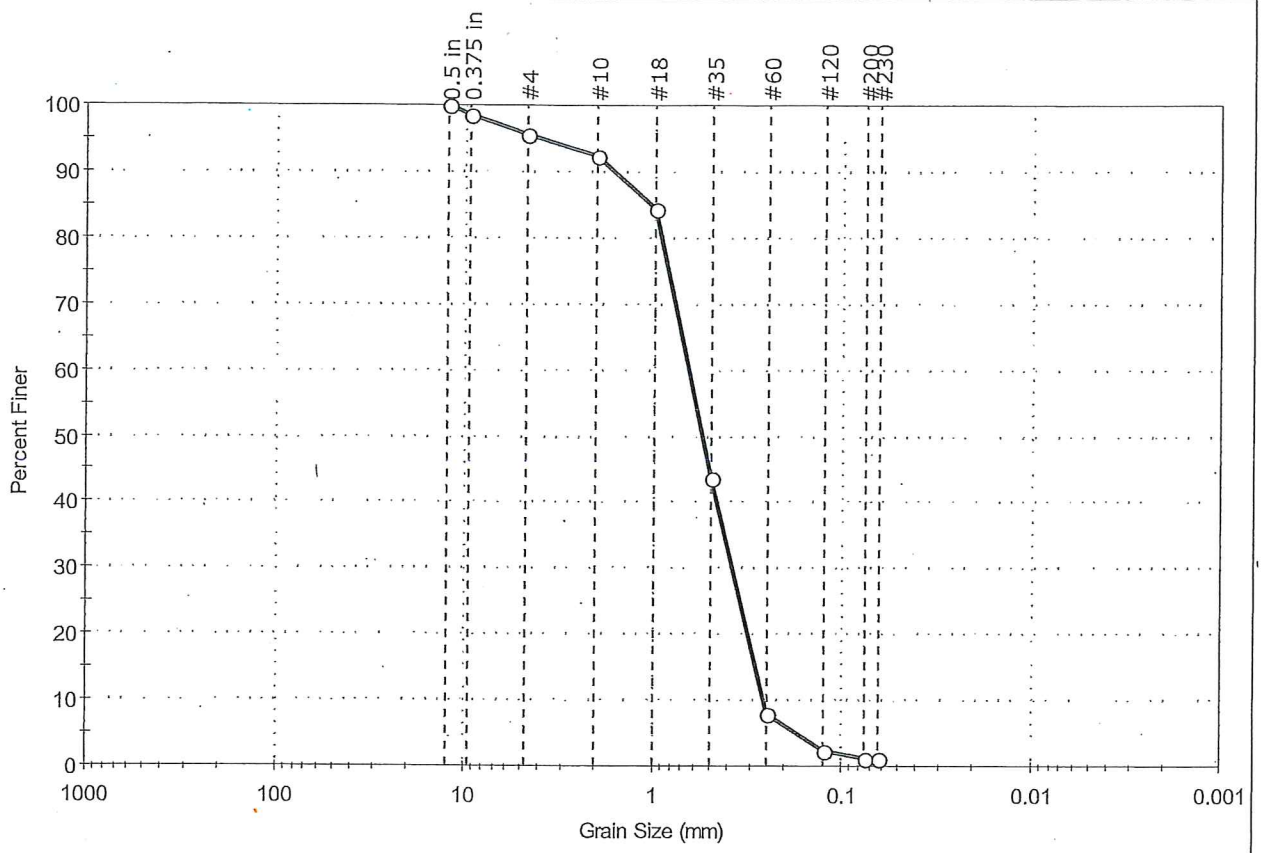
GeoTesting EXPRESS

Client:	Woods Hole Group				
Project:	Orleans Nauset Estuary				
Location:	Nauset Inlet, MA			Project No:	GTX-304172
Boring ID:	2015-0121	Sample Type:	bag	Tested By:	jbr
Sample ID:	N-4	Test Date:	01/04/16	Checked By:	emm
Depth :	0-3.3 ft	Test Id:	359157		
Test Comment:	---				
Visual Description:	Moist, pale brown sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	4.5	94.2	1.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	99		
#4	4.75	95		
#10	2.00	92		
#18	1.00	84		
#35	0.50	44		
#60	0.25	8		
#120	0.12	2		
#200	0.075	1.3		
#230	0.063	1		

Coefficients

D_{85} = 1.0677 mm D_{30} = 0.3837 mm
D_{60} = 0.6607 mm D_{15} = 0.2872 mm
D_{50} = 0.5568 mm D_{10} = 0.2607 mm
C_u = 2.534 C_c = 0.855

Classification

ASTM Poorly graded sand (SP)

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

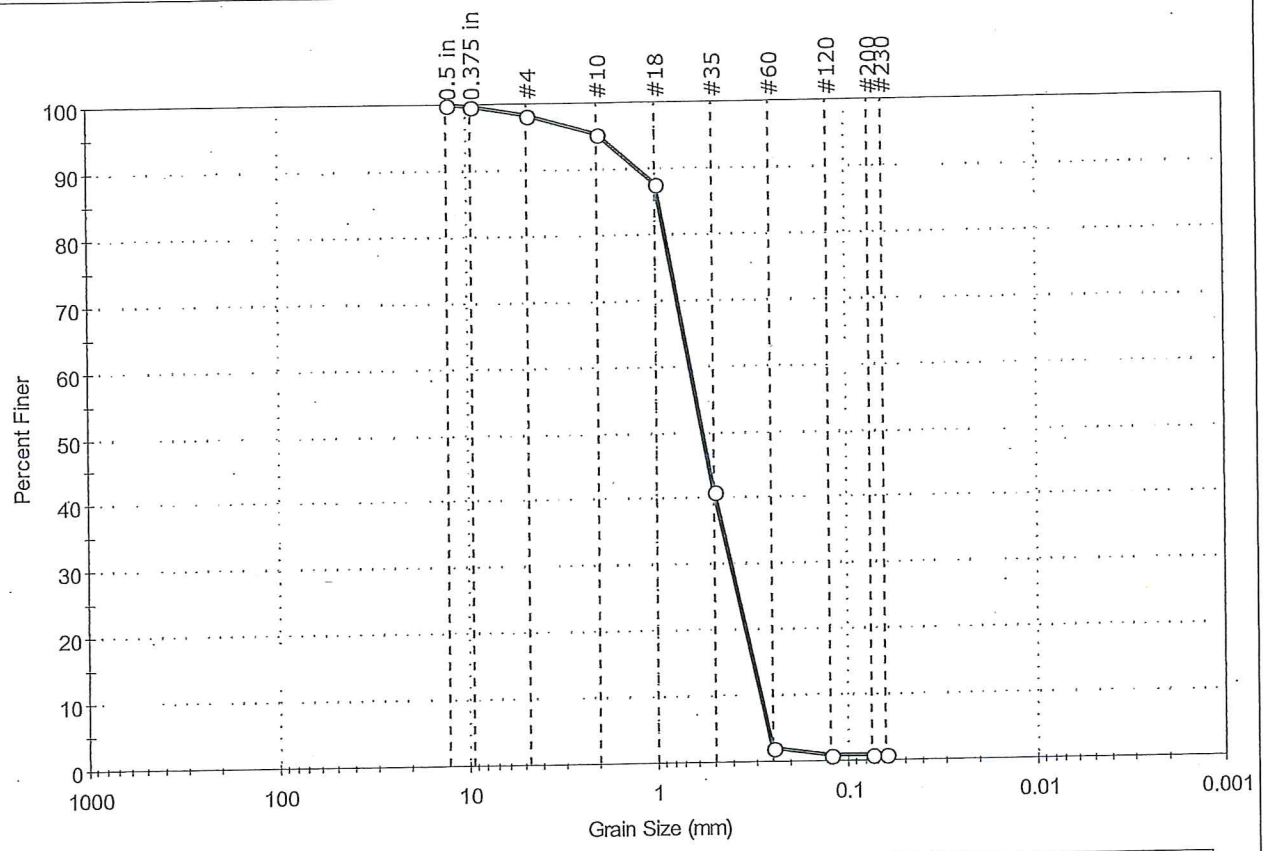
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Woods Hole Group				
Project:	Orleans Nauset Estuary			Project No:	GTX-304172
Location:	Nauset Inlet, MA				
Boring ID:	2015-0121	Sample Type:	bag	Tested By:	jbr
Sample ID:	N-5	Test Date:	12/31/15	Checked By:	emm
Depth :	0-4.5 ft	Test Id:	359158		
Test Comment:	---				
Visual Description:	Moist, pale brown sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.9	97.3	0.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.70	100		
0.375 in	9.50	100		
#4	4.75	98		
#10	2.00	95		
#18	1.00	88		
#35	0.50	41		
#60	0.25	2		
#120	0.12	1		
#200	0.075	0.8		
#230	0.063	1		

Coefficients

D_{85} =0.9623 mm	D_{30} =0.4121 mm
D_{60} =0.6642 mm	D_{15} =0.3155 mm
D_{50} =0.5726 mm	D_{10} =0.2886 mm
C_u =2.301	C_c =0.886

Classification

ASTM Poorly graded sand (SP)

AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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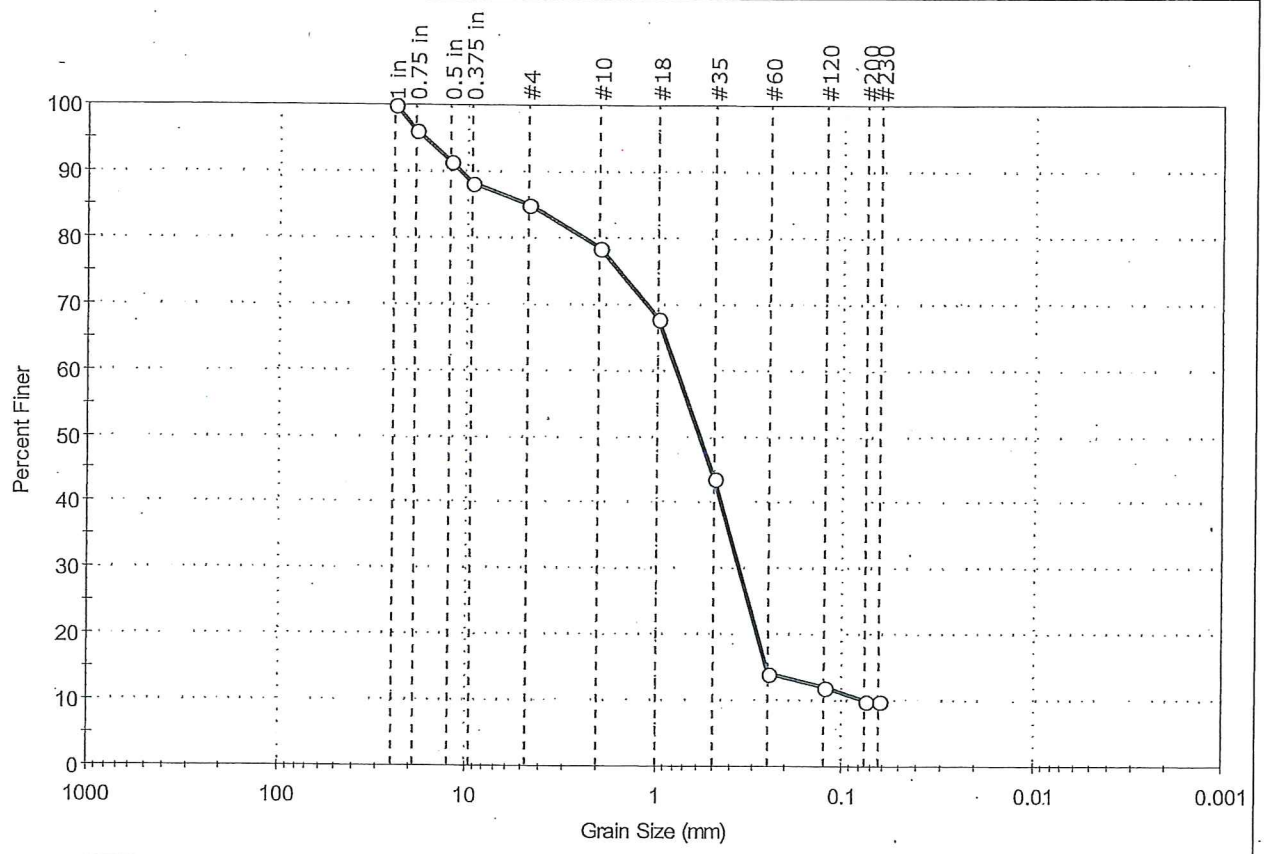
GeoTesting EXPRESS

Client:	Woods Hole Group				
Project:	Orleans Nauset Estuary				
Location:	Nauset Inlet, MA			Project No:	GTX-304172
Boring ID:	2015-0121	Sample Type:	bag	Tested By:	jbr
Sample ID:	N-5	Test Date:	01/04/16	Checked By:	emm
Depth :	4.56-4.84 ft	Test Id:	359159		
Test Comment:	---				
Visual Description:	Moist, brown sand with silt and gravel				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	15.0	74.9	10.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	96		
0.5 in	12.50	91		
0.375 in	9.50	88		
#4	4.75	85		
#10	2.00	78		
#18	1.00	68		
#35	0.50	44		
#60	0.25	14		
#120	0.12	12		
#200	0.075	10		
#230	0.063	10		

Coefficients

D_{85} =4.7159 mm D_{30} =0.3619 mm
D_{60} =0.7966 mm D_{15} =0.2543 mm
D_{50} =0.5982 mm D_{10} =N/A
C_u =N/A C_c =N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

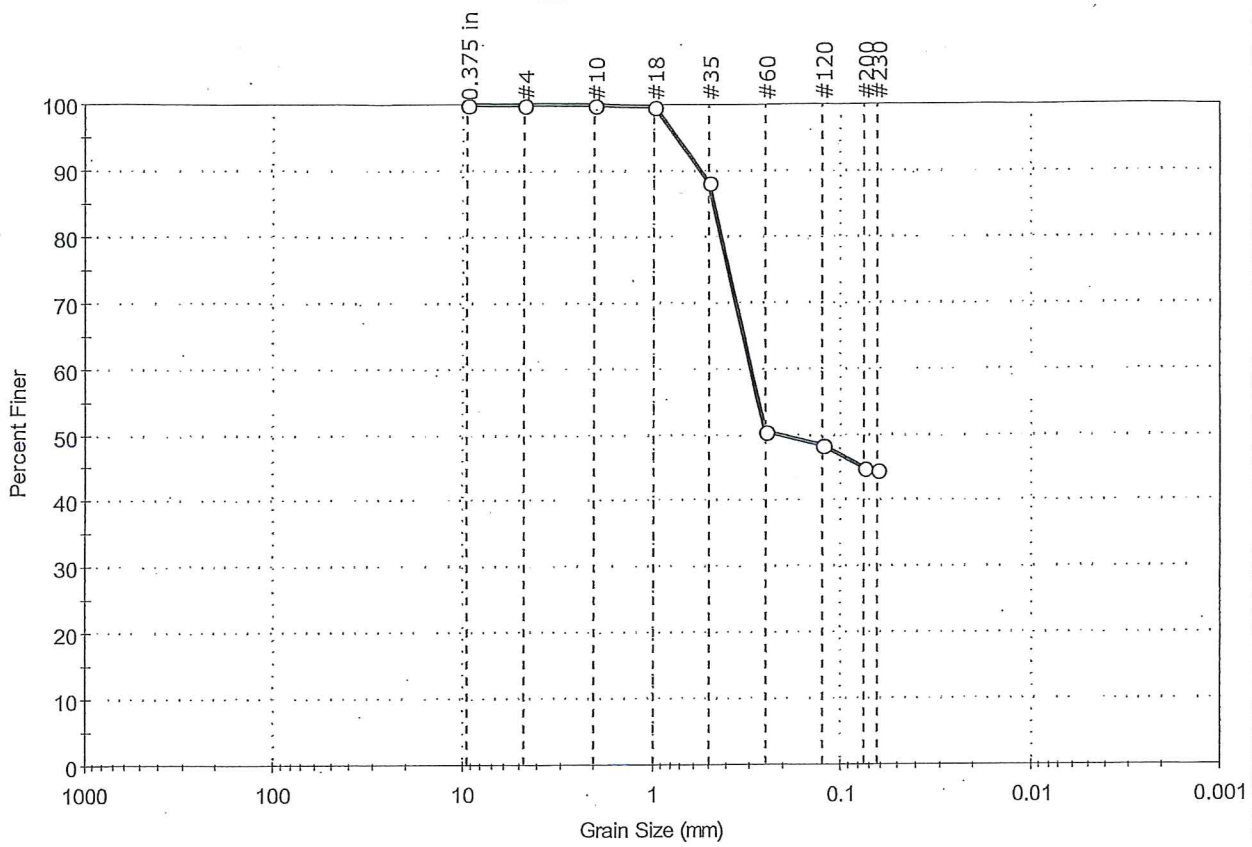
Sand/Gravel Particle Shape : ROUNDED

Sand/Gravel Hardness : HARD

GeoTesting EXPRESS

Client:	Woods Hole Group				
Project:	Orleans Nauset Estuary				
Location:	Nauset Inlet, MA			Project No:	GTX-304172
Boring ID:	2015-0121	Sample Type:	bag	Tested By:	jbr
Sample ID:	N-6	Test Date:	01/04/16	Checked By:	emm
Depth :	0.2-0.6 ft	Test Id:	359161		
Test Comment:	---				
Visual Description:	Moist, olive silty sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	55.3	44.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#18	1.00	100		
#35	0.50	88		
#60	0.25	51		
#120	0.12	48		
#200	0.075	45		
#230	0.063	44		

Coefficients

D_{85} = 0.4722 mm D_{30} = N/A

D_{60} = 0.2978 mm D_{15} = N/A

D_{50} = 0.2097 mm D_{10} = N/A

C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

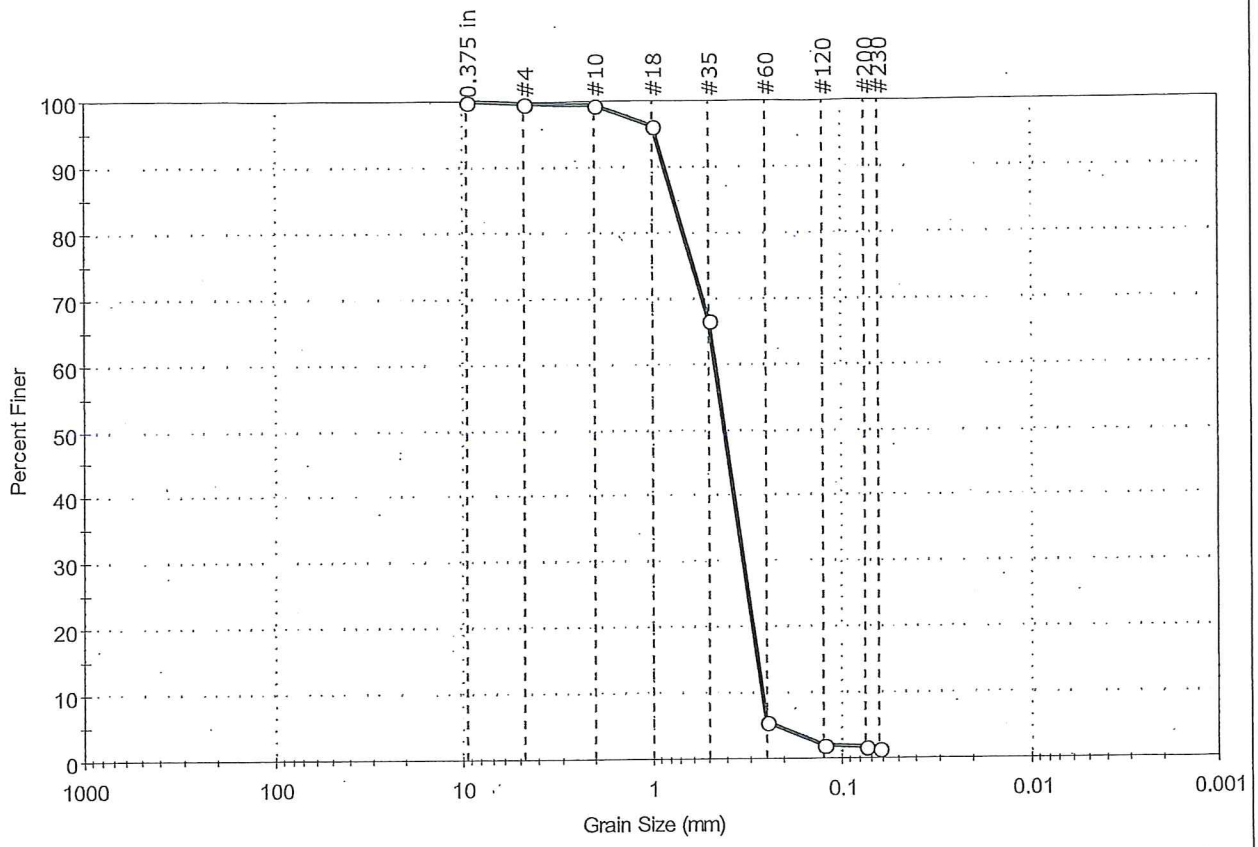
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

GeoTesting EXPRESS

Client:	Woods Hole Group				
Project:	Orleans Nauset Estuary				
Location:	Nauset Inlet, MA			Project No:	GTX-304172
Boring ID:	2015-0121	Sample Type:	bag	Tested By:	jbr
Sample ID:	N-6	Test Date:	01/04/16	Checked By:	emm
Depth :	0.9-3.24 ft	Test Id:	359160		
Test Comment:	---				
Visual Description:	Moist, gray sand				
Sample Comment:	---				

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.2	98.2	1.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	99		
#18	1.00	96		
#35	0.50	67		
#60	0.25	6		
#120	0.12	2		
#200	0.075	1.6		
#230	0.063	2		

Coefficients

D_{85} = 0.7699 mm	D_{30} = 0.3297 mm
D_{60} = 0.4637 mm	D_{15} = 0.2780 mm
D_{50} = 0.4139 mm	D_{10} = 0.2627 mm
C_u = 1.765	C_c = 0.892

Classification

ASTM — Poorly graded sand (SP)

AASHTO — Stone Fragments, Gravel and Sand (A-1-b (1))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Town of Eastham

Fire Department and Emergency Medical Services

Kent Farrenkopf

Chief of Department

2520 State Highway Eastham, MA 02642

508-255-2324

Memo

Date: October 19, 2017

To: Selectmen McDonald

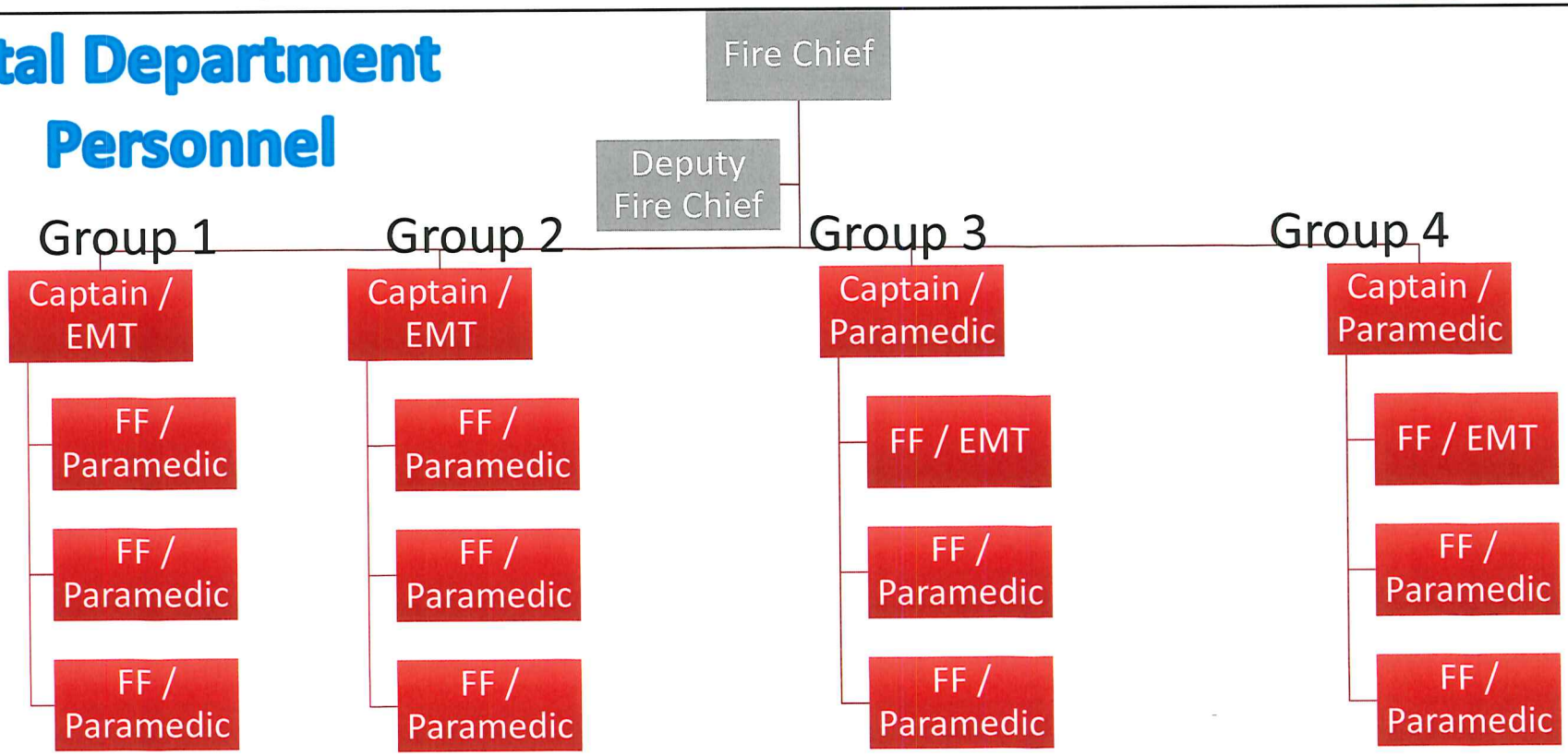
From: Chief Farrenkopf

Subject: Eastham Fire Department Organizational Chart

Please see the attached Eastham Fire Department organizational charts you requested. If you have any questions, please call me at 774-212-2486

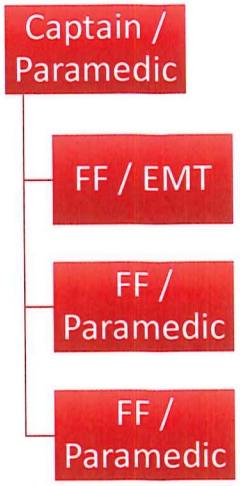
Eastham Fire Department
Organizational Chart

Total Department Personnel



Eastham Fire Department
Organizational Chart

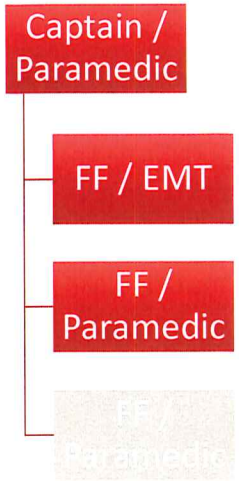
Full Shift:



Personnel on duty: 4

Eastham Fire Department
Organizational Chart

With one person off:



➡Off Duty

(i.e.: Training, Sick, Vacation, or Line of Duty Injury)

Personnel on duty: 3