AGENDA

Tuesday

February 16, 2016

TOWN OF EASTHAM
AGENDA
BOARD OF SELECTMEN
Tuesday, February 16, 2016
5:00 p.m.

Location: *Earle Mountain Room*

I. PUBLIC/SELECTMEM INFORMATION

II. APPOINTMENTS

5:05 p.m. Wastewater Management, ***Jessica Janney, GHD Consulting & Jane Crowley, Health Agent***
Presentation on the town's wastewater planning efforts both historically and at present, with a focus on the review of technical material to update the wastewater plan by GHD and continuing town efforts in 2016. This is part II in the wastewater planning series. (No vote is anticipated)

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

III. ADMINISTRATIVE MATTERS

A. Action/Discussion

1. Appointment(s) to Committees;
   a. James Cohen as a regular member to the Old Town Historic District Commission; term to commence February 16, 2016 and expire on June 30, 2016. He will take Mary Nicolini's unexpired term.
   b. Ruth Gail Cohen as a regular member of the Search Committee; term to commence February 16, 2016 and expire June 30, 2017. She will take the place of Barbara Stahl, whose term expired in June 2014.
   c. Joanna Buffington as a regular member to the Open Space Committee; term to commence February 16, 2016 and expire June 30, 2017. She will take the place of Steve Gulrich whose term expired in June 2014.
   d. Carolyn McPherson as a Member-at-Large to the Community Preservation Committee: term to commence February 16, 2016 and expire June 30, 2018. She will take the place of Judith Poulin whose term ended June 30, 2015.
2. Approve Ragnar Relay, May 13-14, 2016
3. Approve MS Challenge Walk, September 9-11, 2016
4. Approve and Sign Conservation Restriction for Terrapin Cove Property. Conservation Commission approved on January 26, 2016.

IV. TOWN ADMINISTRATOR'S REPORT

V. OTHER BUSINESS

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

Upcoming Meetings

February 17, 2016	*3:00 p.m.*	*Earle Mountain Room*	*Work Session*
February 24, 2016	*3:00 p.m.*	*Earle Mountain Room*	*Work Session*
February 29, 2016	*5:00 p.m.*	*Earle Mountain Room*	*Work Session*
March 2, 2016	*3:00 p.m.*	*Earle Mountain Room*	*Work Session*

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

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

II. 5:05 pm

Town of Eastham

Wastewater Management in Eastham

Jessica Janney | GHD
Jane Crowley | Town of Eastham

Presentation outline

- Wastewater Planning
- Brief Summary of Previous Planning Efforts (2009)
- Current Planning Efforts
  - Review of Tech Memo No. 1
  - Review of Tech Memo No. 2
- Next Steps under this Current Project
- Future Planning

Planning effort history

2009 Planning Efforts

Interim Needs Assessment Report and Alternatives Screening Analysis Report (March 2009)

Wastewater Management Planning Project Plan Evaluation Report (June 2009)

Human health needs	Environmental health needs	
Public water supply	Nauset-Town Cove Estuary - advanced treatment	Rock Harbor Estuary re-classification and/or advanced treatment
		Freshwater ponds treatment

Current planning efforts

Continuing Wastewater Planning Services (2015)

Work Completed:	Work To Do:
Prepare Grant Application	[illegible]
Develop Preliminary Estimate of Wastewater Flows	[illegible]
Technical Memo No. 1	[illegible]
Technical Memo No. 2	
Public Meeting	
Meetings	

Tech Memo No. 1

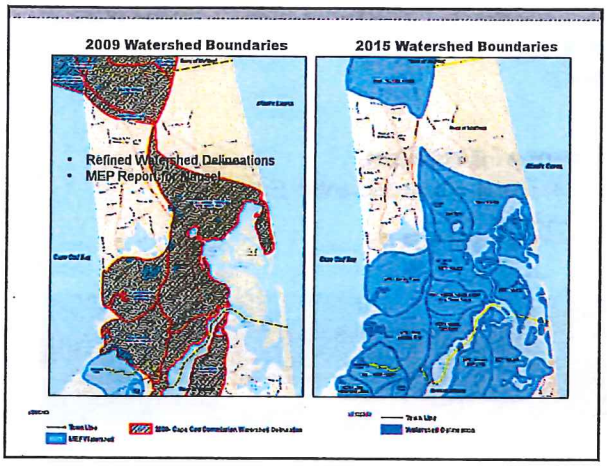
Purpose – Update 2009 Needs Assessment Report

Nauset Estuary:

- MEP Draft Report for Nauset – revised nitrogen removal %'s
- Refined watershed delineations for Nauset Harbor Embayment System (CCC to MEP)
  - Town Cove (including Mary Chase Gauge & Nauset Stream)
  - Salt Pond (Salt Pond & Minister's Pond)

Rock Harbor Estuary:

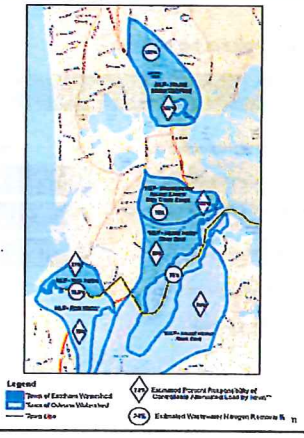
- Delineation unchanged
- MEP report complete for 2009 planning



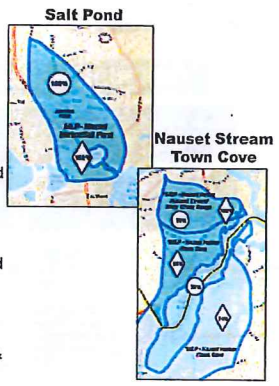
Watershed Priority Areas

Eastham Estimated Controllable Wastewater Load Reductions Needed in:

- Salt Pond
- Nauset Stream / Mary Chase Gauge
- Town Cove
- Rock Harbor



Nauset Estuary



Nauset Estuary – (estimates based on MEP and CCC)

Salt Pond:

- 100% WW Removal
- Eastham is 100% responsible for load

Nauset Stream / Mary Chase Gauge:

- 75% WW Removal
- Eastham is 100% responsible for load

Town Cove:

- 75% WW Removal
- Eastham is 25% responsible for load
- Orleans is 74% responsible for load & Brewster is 1%

Rock Harbor Estuary

Rock Harbor Estuary – (estimates based on MEP and CCC)

Rock Harbor:
- 78.8% WW Removal
- Eastham is 21% responsible for load
- Orleans is 79% responsible for load

- Orleans and Eastham should continue to work together for re-classification

Rock Harbor

Findings - Water Use

- Single family residential water use focus
- Estimated removals using a phased approach
  - Eastham doesn't have metered water use
- Awaiting TMDLs for each of the Town's Estuaries

Estimated MEP % Removal	Sub-watershed	Based on Eastham Water System	Based on 208 Plan Water Use
		Estimated Min. WW Load to Remove (kg/yr)[2]	Estimated Max. WW Load to Remove (kg/yr)[1]
75%	Town Cove Total[3]	1,840	2,720
100%	Salt Pond Total[4]	1,350	1,860
78.8%	Rock Harbor	240	470

(1) Removal % needed is based on existing loads; all future loads beyond the existing load will need to be removed 100%. Based on a capewide average of 80% of water flow (181.51 x 80% = 163.36)
(2) Minimum loads based on Eastham wastewater generation rate assumption of 122 gpd.
(3) Includes Town Cove, Mary Chase Gauge and Nauset Stream.
(4) Includes Salt Pond and Minsters Pond.

Tech Memo No. 2

Purpose – Update 2009 Alternatives Screening Analysis Report (ASAR)
Outline:

- Reconsideration of Alternatives Screened
- Consideration of 208 Plan Bookend Evaluations
  - Non-Traditional
  - Traditional
- Proposed Hybrid Evaluation Process

Comparison of Technologies Table

Table 1 – Comparison of Technologies

Example:
- Green Infrastructure
  - Technologies Considered in 2009
  - Technologies Considered as part of 208 Plan
  - 2009 Recommendations
  - Updated Recommendations

Comparison of Technologies Table (Excerpt)

Table 1 → Comparison of Technologies Discussed in the 2009 ASAR and the CCC 208 Plan

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
Green Infrastructure	Natural Treatment Systems: ↔ Constructed Wetlands for Nitrogen Attenuation ↔ Hydroponic systems	↔ Constructed Wetlands → Surface Flow → Subsurface Flow → Groundwater Treatment ↔ Hydroponic Treatment ↔ Phytoirrigation ↔ Phytoremediation	Not included in the Alternative Wastewater Management Plans (WMAs) selected for detailed evaluation.	It is recommended that these approaches be retained as part of an adaptive management program and may be considered for further evaluation and practical opportunities as more data on their viability becomes available through regional piloting and DEP guidance.
	Stormwater Best Management Practices: ↔ Subsurface leaching pits ↔ Vegetated swales or basins ↔ Constructed wetlands	Stormwater Best Management Practices: ↔ Phytobuffer ↔ Vegetated Swale ↔ Gravel Wetland ↔ Bioretention/Soil Media Filters ↔ Constructed Wetlands	Recommended for Town-wide implementation as part of all the WMAS selected for detailed evaluation.	Recommended for Town-wide implementation as part of all the WMAS selected for detailed evaluation.

ASAR = Alternatives Screening Analysis Report

Table Topics with Technologies Considered for Hybrid Evaluations in Tech Memo's 3 &4

Green Infrastructure	Stormwater BMPs Natural Treatment Systems
Innovative & Resource Management Technologies	Shellfish Aquaculture/Propagation PRBs
Waste Reduction Toilets	Composting, Incinerating, Waterless, Tight Tanks
Non-Structural Approaches	Fertilizer Reductions Stormwater BMPs
System Alternatives	Coastal Habitat Restoration Pond Treatment
On-Site Systems, Treatment Systems, Collection Systems, Effluent Disposal, Solids Processing	On-Site Treatment (I/A) Centralized Treatment Etc.

Purpose – Update 2009 ASAR Summary of Recommendations

Town interest incorporating following **non-traditional technologies** into hybrid evaluations

Green Infrastructure	Stormwater reductions (Salt Pond Drainage Improvements Project)
Innovative & Resource Management Technologies	PRB Town landfill - Salt Pond
	Shellfish aquaculture propagation
Non-Structural Approaches	Adopted Fertilizer Bylaw

Purpose – Update 2009 ASAR Summary of Recommendations

Town interest incorporating following **traditional technologies** into hybrid evaluations

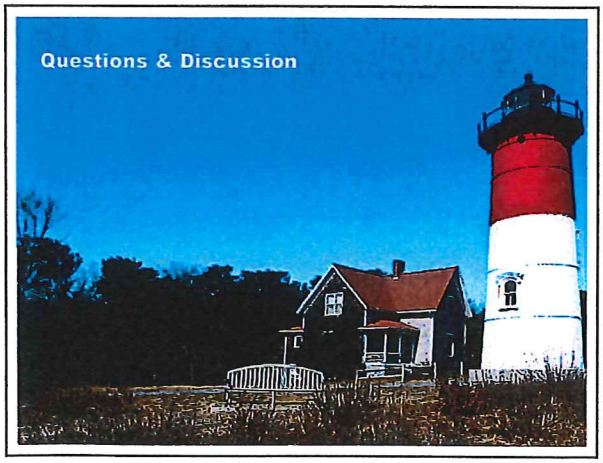
On-Site Treatment Systems Collection & Treatment Systems	Improvements to CCNS Salt Pond Visitor Center On-Site System
	Connection to Orleans WWTF
	WWTF in Eastham

Next steps under this current project

Continuing Wastewater Planning Services (2015)

Work Completed:	Work To Do:
Prepare Grant Application	Summary Newsletter
Develop Preliminary Estimate of Wastewater Flows	Technical Memo No. 3 – Salt Pond Hybrid
Technical Memo No. 1	Technical Memo No. 4 – Town Cove Hybrid
Technical Memo No. 2	
Public Meeting	
Meetings	

Future Planning – To Do List



GHD

www.ghd.com

Update to Board of Selectmen on Eastham's Wastewater Management Planning Project

February 16, 2016

This one-page Brief is intended to provide an outline and summary of the information developed for Technical Memorandum No. 1: Update to Needs Assessment, and Technical Memorandum No. 2: Update to Alternatives Screening Analysis. The Technical Memorandum, as called for under GHD's current Scope of Services, is being prepared to update the Town's 2009 planning efforts. These efforts included Eastham's Interim Needs Assessment and Alternatives Screening Analysis Report (ASAR) dated March 2009 and the Wastewater Management Planning Project, Plan Evaluation Report dated June 2009. The current efforts build upon that information and incorporate updated Massachusetts Estuaries Project (MEP) data and data from the Cape Cod Area Wide Water Quality Management Plan Update (208 Plan) developed by the Cape Cod Commission. The focus of the technical memoranda is only on the wastewater planning component of the 2009 reports and recommendations.

Brief Summary of Technical Memorandum No. 1:

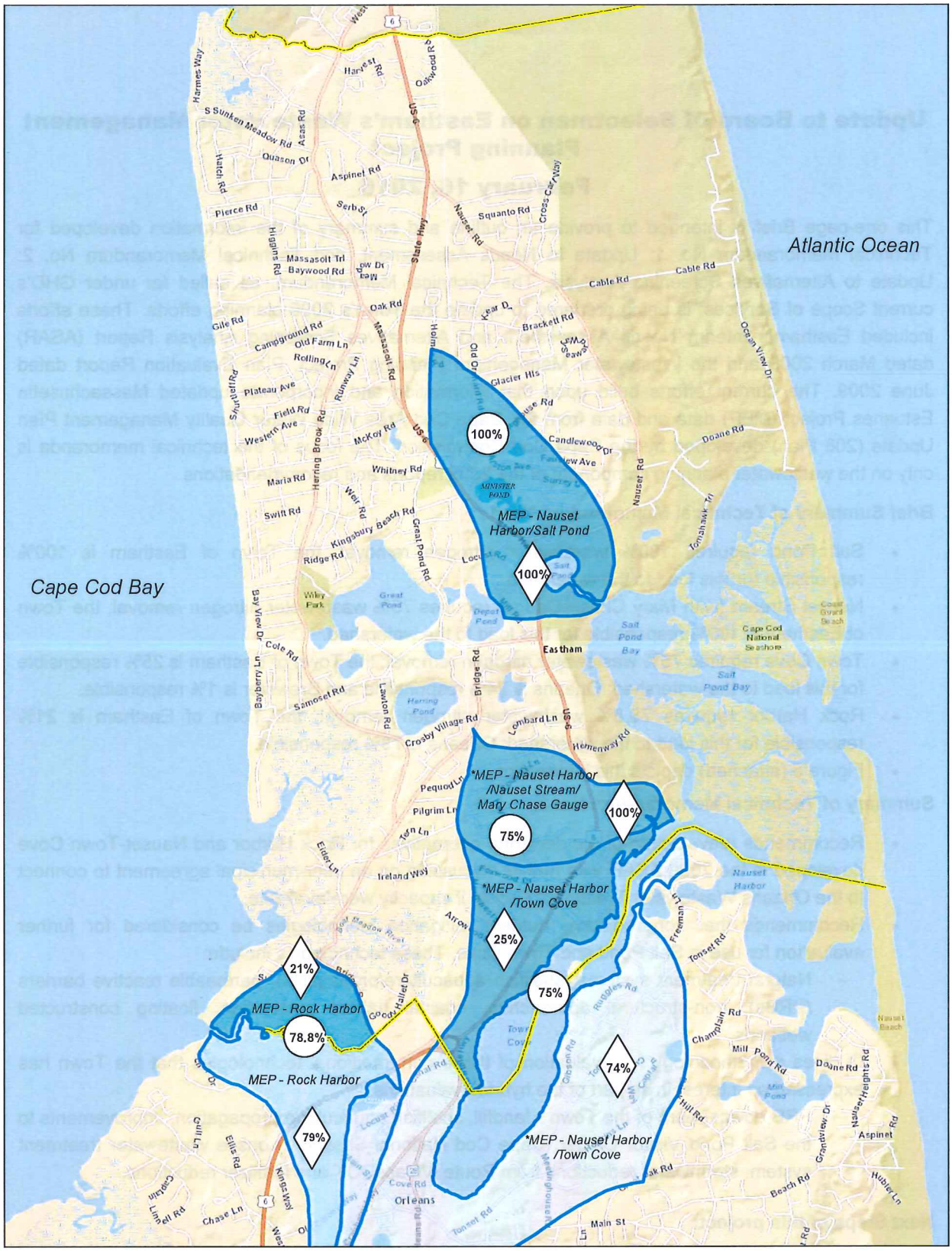
- Salt Pond requires 100% wastewater nitrogen removal; the Town of Eastham is 100% responsible for this load to the watershed.
- Nauset Stream (with Mary Chase Gauge) requires 75% wastewater nitrogen removal; the Town of Eastham is 100% responsible for this load to the watershed.
- Town Cove requires 75% wastewater nitrogen removal; the Town of Eastham is 25% responsible for this load to the watershed; Orleans is 74% responsible and Brewster is 1% responsible.
- Rock Harbor requires 78.8% wastewater nitrogen removal; the Town of Eastham is 21% responsible for this load to the watershed; Orleans is 79% responsible.
- Figure 5 (attached) depicts this information.

Summary of Technical Memorandum No. 2:

- Recommends reevaluation of the sewering alternatives for Rock Harbor and Nauset-Town Cove developed in the 2009 ASAR with further discussion on an inter-municipal agreement to connect to the Orleans Wastewater Treatment Facility if capacity were available.
- Recommends that non-traditional nutrient mitigation technologies be considered for further evaluation for use in Salt Pond and Town Cove. These technologies include:
  - Natural treatment systems, shellfish aquaculture/propagation, permeable reactive barriers (PRBs), non-structural approaches, coastal habitat restoration, floating constructed wetlands.
- Outlines a methodology for evaluation of those non-traditional technologies that the Town has expressed an interest in as part of the hybrid evaluations.
  - PRB downstream of the Town's landfill, shellfish aquaculture/propagation, improvements to the Salt Pond Visitor Center (Cape Cod National Seashore) onsite wastewater treatment system, stormwater reductions from Route 6/MassDOT and fertilizer reductions.

Next Steps of this project:

- Newsletter development to summarize findings of Technical Memoranda Nos. 1 and 2.
- The results of the hybrid evaluations will be summarized in Technical Memoranda Nos. 3 and 4.



N:\US\Hyannis\Projects\8618665\GIS\Maps\MXD_Deliverables\18665F05.mxd
1545 Iyannough Road, Hyannis Massachusetts 02601 USA T 1 508 362 5680 F 1 508 362 5684 E hyamail@ghd.com W www.ghd.com

TECHNICAL MEMORANDUM NO. 1

February 10, 2016

To	Town of Eastham		
Copy to	Jane Crowley		
From	Jessica P. Janney	Tel	774-470-1636
	J. Jefferson Gregg, P.E., BCEE		774-470-1640
	Anastasia Rudenko, P.E. , ENV SP		774-470-1637
Subject	Eastham Wastewater Management Plan Update to Wastewater and Nitrogen Management Needs Assessment	Job No.	8618665

1. INTRODUCTION AND SCOPE

The purpose of this Technical Memorandum No. 1 is to provide an update to the March 2009 Interim Needs Assessment with respect to the third recommendation of the wastewater plan which was focused on the environmental health need of the Nauset-Town Cove Estuary and Rock Harbor Estuary. This Needs Assessment update will guide the update to the alternatives analysis (to be summarized in Technical Memorandum No. 2) and the Town decision-making to develop a revised/updated wastewater management plan.

This memo is focused on wastewater planning which was put on hold with the intent of waiting until the nitrogen limits were established through a TMDL by MassDEP and until Orleans completed its wastewater planning process. Both of those actions are either underway or completed and the County's Regional 208 Plan is final. The Town is in a position to re-initiate the third task of the wastewater nitrogen management planning process. However, the means of addressing the nitrogen load to Nauset Harbor, Town Cove, Salt Pond and Rock Harbor will likely change as a result of: Orleans' recent planning efforts, updates to the areas of need based on new nitrogen loading information developed as part of the MEP program and the additional tools the 208 Plan is promoting.

A new wrinkle is the CCCs development of a TWMP approach to planning. This allows communities to focus in on particular watersheds outside of completing a full community-wide CWMP. It is envisioned that Targeted Watershed Management Plans (TWMP) will need to be developed in the future for Salt Pond, Town Cove, and Rock Harbor in accordance with the new regulatory review process recommended by the 208 Plan. Development of these TWMPs may be several years in the future. In addition, watershed reports must be completed by June 2016 that may include traditional and non-traditional scenarios.

The Town of Eastham has been developing a Wastewater Management Plan since 2007 and completed their Interim Needs Assessment and Alternatives Screening Analysis Report in March 2009 and their Wastewater Management Planning Project Plan Evaluation Report in June 2009. In summary, the Town's wastewater plan in 2009 focused on the Nauset Harbor/Town Cove estuaries and Rock Harbor and included the following components:

GHD Inc. 1545 Iyannough Road Hyannis MA 02601 USA
T 1 774 470 1630 **F** 1 774 470 1631 **E** hyamail@ghd.com **W** www.ghd.com

1. Development of a public water supply system that draws water from a protected source to address septic-system wastewater impacts on individual private water supplies.
2. Development of a Ponds Action Plan and remediation of the Town's freshwater ponds that are most impacted from eutrophication (excessive algal growth) caused by excessive phosphorus loading to the freshwater ponds from several sources including wastewater.
3. Development of a wastewater collection system to collect wastewater from the Nauset-Town Cove Estuary, and Rock Harbor watersheds for treatment and discharge at the Tri-Town Septage Treatment Plant site in association with the Orleans wastewater management plan.

This planning effort was completed before the nitrogen limits were fully developed for the marine estuaries of Nauset Harbor/Town Cove Rock Harbor and the Town's other coastal embayments.

The first two components have been initiated and implementation is in progress as follows:

- The Town's municipal Town-wide water system construction is currently underway.
- The Town has also performed pond treatments (with alum) at Herring Pond and Great Pond.

2. BACKGROUND

2.1. Previous Findings of Eastham's Wastewater Planning Project Related to Coastal Estuaries and Nitrogen Mitigation

As discussed in the introduction, Eastham completed an Interim Needs Assessment based on information available up to 2009. The main findings of that Needs Assessment with respect to estuaries are summarized below:

- The Massachusetts Estuaries Project (MEP) had (at that time) initiated evaluations for the Nauset and Rock Harbor Estuaries to identify the ecological health of the estuaries and identify appropriate nitrogen limits.
- In June 2007, the MEP released the Draft Findings (Technical Report) for Rock Harbor with watershed delineations and the estimate that approximately 79% of the existing wastewater nitrogen loading to the watershed would need to be mitigated to restore the ecological health. Questions were raised on the water quality standard that was used to evaluate Rock Harbor. The report was finalized in December 2008. No nitrogen TMDL had been developed for this estuary as of 2009 (nor has one been produced by June 2015).
- As of 2009, the MEP had not identified estuary delineations or nitrogen limits for Nauset. Due to Eastham's desire to move the wastewater plan forward based on the best information available, the following assumptions were applied:
  - Watershed delineations developed by the Cape Cod Commission were used.
  - An estimate that 55% of the existing wastewater nitrogen loading to the entire watershed would need to be mitigated to restore the ecological health, as estimated by the Town of Orleans in their wastewater planning evaluations.

- The MEP had not yet initiated similar evaluations for Wellfleet Harbor, Boat Meadow, or Herring River; therefore no nitrogen removal assumptions were made for the small portion of the Wellfleet Harbor watershed or for Boat Meadow or Herring River. As part of the Cape Cod Commission 208 planning efforts, nitrogen loading information has been compiled, including the percentage that is estimated to originate from Eastham; however the removal thresholds for these sub-embayments have not been set and are awaiting the completion of the MEP efforts.

Figure 1 illustrates the watersheds and nitrogen removal limits as reported in the 2009 Needs Assessment.

Appendix A contains the summary newsletter of the previous wastewater planning efforts as well as a CD of the previous planning documents.

2.2. MEP and Third Party Evaluations for the Nauset Estuary Since 2009

MEP evaluations for Nauset Estuary were completed and are summarized in a draft technical report dated May 2012. The Town of Orleans commissioned a third party technical review of the MEP report by RPS-ASA of South Kingstown, Rhode Island dated November 2012. The third party technical review was followed by a Technical Memorandum from MEP dated December 4, 2012 which was then followed by an Addendum to the third party technical review dated December 24, 2012. The MEP has not yet released a final technical report for Nauset Estuary, and a TMDL has not yet been developed.

Figure 1 shows the 2009 watershed boundaries with removal percentages and Figure 2 shows the updated watershed boundaries with removal percentages. Figures 3 and 4 show the change in the watershed delineations and the refinement of target areas of removal. As shown in Figure 2, the extent of the watershed to Town Cove is extended northward to include Mary Chase Gauge and Nauset Stream. The remaining focus of the Nauset Marsh estuary examined in 2009 is now targeted around Ministers Pond and Salt Pond watersheds. Because only a small percentage (less than 2% of the total nitrogen load) of Depot Pond contributes to Salt Pond, this portion is not currently included in the watershed area being targeted for 100%. The attenuation factors and loads are shown in Table IV-2, "Nauset Estuary Watershed Nitrogen Loads" from the MEP Nauset Harbor Embayment System Report, Revised Draft Report, May 2012.

2.2.1. Nauset Marsh Estuary Contributory Areas and Delineation

As discussed in Section III.3 of the MEP Draft Report for Nauset Harbor Embayment System, the refined watershed and sub-watershed boundaries for the Nauset Marsh embayment system, including Town Cove, Salt Pond, and Ministers Pond and other sub-estuaries were determined by the USGS. Model outputs of watershed boundaries were "smoothed" to further define the subembayments. The smoothing refinement was a collaborative effort between the USGS and the rest of the MEP Technical Team. Overall, 13 sub-watershed areas plus a portion of the flow from Bakers Pond were delineated within the Nauset Estuary study area.[1]

The MEP watershed delineation for the Nauset Marsh system as a whole is roughly the same as the one developed by the CCC in 1998 (6,361 acres vs. 6,425 acres, respectively). The delineations are slightly

[1] Howes B., S. Kelley, J.S. Ramsey, E. Eichner, R. Samimy, D. Schlezinger, P. Detjens (2011). Massachusetts Estuaries Project Linked Watershed-Embayment Approach to Determine Critical Nitrogen Loading Thresholds for the Nauset Harbor Embayment System, Towns of Orleans and Eastham, Massachusetts, Massachusetts Department of Environmental Protection. Boston, MA.[2] Orleans CWMP/SEIR, Executive Summary page ES-4.

different, largely due to the internal sub-watershed refinements identified in the MEP reports and the change in location of the regional groundwater divide in the Nauset Lens. The MEP watershed delineation also includes interior sub-watersheds to various components of the Nauset Marsh system, such as ponds that were not fully included in the CCC delineation, as well as sub-watersheds to the stream gauged during the MEP: near Mary Chase Road. These refinements are considered a benefit of the update of the USGS regional groundwater models.[1]

Table 1 shows the updated estimated percentage of septic system nitrogen to be removed from these targeted watersheds.

Table 1 MEP Table VIII-2 from the May 2012 Revised Draft Report for Nauset Harbor Embayment System

Comparison of Sub-embayment Watershed Septic Loads (attenuated)			
Sub-embayment	Present septic load (kg/d)	Threshold septic load (kg/d)	Threshold septic load % change
Salt Pond/Ministers	4.15	0.00	-100%
Town Cove	24.27	6.07	-75%
Nauset Stream / Mary Chase Gauge	1.90	0.47	-75%

As shown in Table 1, the estimated percent nitrogen removal from septic systems in these areas has changed from the assumed 55% across the entire Nauset System to 100% in the Salt Pond/Ministers Pond watersheds and 75% in the Town Cove/Nauset Stream/Mary Chase Gauge watersheds.

2.3. Town of Orleans CWMP Project

The Town of Orleans CWMP was initially completed in December 2010 with the submission of their Comprehensive Wastewater Management Plan and Single Environmental Impact Report (CWMP/SEIR) by Wright-Pierce. This plan was reviewed under and approved by the Massachusetts Environmental Protection Act (MEPA) as summarized in the January 28, 2011 MEPA Certificate, and approved by the Cape Cod Commission (CCC) in their October 31, 2011 Development of Regional Impact (DRI) decision. These three documents are located on the Town of Orleans Web site at http://www.town.orleans.ma.us/water-quality-advisory-panel/pages/cwmpwastewater-archives.

The Orleans CWMP/SEIR provides discussion on the opportunity for regionalization of wastewater management with Eastham and Brewster after the first three phases of the Orleans core program[2].

There have been several additional planning efforts to identify additional and/or different wastewater and nutrient management approaches in Orleans as identified on the Town's Web site. The most recent effort was a series of evaluations using the 208 planning methods developed by the Cape Cod Commission.

[2] Orleans CWMP/SEIR, Executive Summary page ES-4.

These evaluations and the resulting Town decision-making process resulted in a group of agreed upon goals, objectives, plan approaches, and commitments that are summarized in a March 2015 Consensus Statement (attached in Appendix B). In addition, a *Conceptual Approach to Meet Orleans Water Quality Goals* (attached in Appendix B) developed by Stantec estimates technologies and sizes within each watershed that could reasonably be implemented to help meet TMDLs and water quality needs. This document and conceptual map prepared for that project identify the next steps and proposed approaches for Orleans.

2.4. Cape Cod Commission 208 Planning

The Cape Cod Commission has finalized their Cape Cod Area Wide Water Quality Management Plan Update (208 Plan) and it has been approved by USEPA. This document identifies many nitrogen management and planning components that can be used as part of a municipal wastewater planning process, such as Eastham's, including:

- Identification of Waste Management Agencies (WMA) that will work to share responsibility to meet the nitrogen TMDLs for coastal estuaries.
- Development of Watershed Reports for each watershed wholly or partially within Town boundaries.
- Expanded innovative and alternative nitrogen management approaches and technologies.
- New wastewater management evaluation tools to estimate existing and future wastewater flows and nitrogen loading as well as alternative wastewater nitrogen management scenarios.
- The requirement to complete a Targeted Watershed Management Plan (TWMP) for estuaries and their watersheds that exceed established nitrogen TMDLs.
- Revised regulatory procedures to streamline the review process when TWMP is properly completed.
- Recommendations to MassDEP to develop a watershed permitting program to allow nitrogen removal credits for traditional as well as non-traditional management techniques to meet a nitrogen TMDL.
- County support to develop individual TWMPs.

The next steps of Eastham's wastewater management planning project will utilize many of these components.

New wastewater management evaluation tools developed by the Cape Cod Commission include what is commonly referred to in this technical memorandum as "WatershedMVP" which is an abbreviated name for Watershed Multi-Variant Planner. This is an online tool where existing and future water and wastewater flows and loads can be extracted based on Town, watershed or sub-watershed lines or by polygons drawn by the user. The WatershedMVP tool was used during the development of this Technical Memorandum when examining estimated wastewater flows and nitrogen loads within the watershed of interest.

2.5. Additional Town and Related Regional Projects

There are other town wastewater planning projects on Cape Cod that can provide information, experience, and cost estimates for Eastham's planning process; and that information will be used as alternative technologies are evaluated.

For example, USEPA released a solicitation in June 2015 requesting a Statement of Interest from Cape Cod Towns with south facing embayments who would be interested in hydrogeological site characterizations for the design of Permeable Reactive Barriers (PRBs). Although Eastham was not one of the municipalities listed with an eligible watershed under the Southeast New England Program (SNEP), the Town submitted a statement of interest with support from the Cape Cod National Seashore (CCNS) for possible PRB site characterization at the CCNS's Salt Pond Visitor Center. One of the requirements of the opportunity was willingness to show other municipalities the site and data for the duration of the project and beyond, should a pilot PRB be constructed at the site. This type of data sharing for non-traditional technologies will have a regional benefit to Towns including Eastham as they move forward in their planning.

There are several grant funding opportunities that should be developed as the Eastham project proceeds to support planning. One grant that was received by the Town was a $30,000 MassDEP grant for Water Infrastructure Planning and Technical Assistance which supports this current effort to update the Town's wastewater management planning project.

The Town is working with EcoLogic to review data files of existing water quality data collected within the estuarine areas. A summary of those findings has been drafted in a Technical Memorandum entitled, "Overview and Implications of the Nauset Harbor Estuary TMDL." In general, the technical memorandum shows how water quality is clearly in decline. The goal of these data review efforts is to show the relation of current and historic water quality data to the data as presented in the existing MEP reports. The scope of this work includes:

Examination of the trophic status of the estuarine waters; that is, the levels of nutrients, phytoplankton pigments, and dissolved oxygen and water clarity conditions in these areas. The technical review and discussion includes:

- Current water quality status with respect to MEP guidelines and TMDL target levels (as relevant).
- Trends in water quality indicators over time.
- Review of findings with Town staff, boards, and interested residents.

A similar review will be conducted for Rock Harbor.

3. EXISTING AND PROPOSED LAND USE IN PROJECT FLOW AREAS

The main project focus area for Eastham at this time is Salt Pond, Town Cove, and Rock Harbor. However, the Town is starting with Salt Pond and Town Cove because both Orleans and Eastham are continuing to coordinate discussions for the reclassification of Rock Harbor from an estuary to a man-made boat basin and because there are no MEP reports developed for the other watersheds in Town.

Figure 1 shows the project focus area which includes Salt Pond and Town Cove which are both located in the Nauset Estuarine System. Salt Pond (including the watershed for Minsters Pond) is entirely within Town

limits and requires 100% removal of existing wastewater nitrogen to the watershed to restore the ecological health. Town Cove is shared with Orleans and requires 75% removal of existing wastewater nitrogen to the watershed to restore ecological health. The Town Cove watershed includes the sub-watersheds for Mary Chase Gauge and Nauset Stream which are completely within the Town boundaries of Eastham.

3.1. Water Use Comparison

The following assumptions and background information are provided for comparison of the various planning efforts and reports; the 2009 planning, MEP reports and the CCC 208 Plan for single family residential water and wastewater flows. The water use data in the CCC 208 Planning Tool has been developed outside of the MEP efforts and is based on available water usage data (2009 to 2011 was cited as the typical years of water data available across communities throughout Cape Cod, but in some cases newer data is available). Since the Town of Eastham does not currently have a public water system in operation, water usage in the CCC 208 Planning tool was estimated based on average values across all of Cape Cod. All previous evaluations for estimating water use, with the exception of the Eastham Water System, assume 90% of total water flow is wastewater flow. The evaluation completed to support the Eastham Water System was developed by using per capita flow estimates for residential and by back calculating a water use from Title 5 wastewater flow estimates for commercial use.

It is our opinion that the CCC 208 Planning Tool assumptions appear to be an overestimate when using a Cape-wide average. Additional data has been requested from the CCC on the values used in Orleans within shared watersheds so that a comparison of residential use within Town Cove and Rock Harbor on the Orleans side (based on actual water use) can be made. This would eliminate assumptions carried across varying demographics on Cape Cod, and should be more representative of water use in Eastham.

Table 2 Assumptions of Planning Efforts to Date for Water and Wastewater Flows in Eastham

Assumption	2009 Planning[1]	MEP Report	CCC 208 Plan	Eastham Water System	Proposed Assumptions[2]
Single Family Residential Water Flow	142 gpd	142 gpd – Rock Harbor 148 gpd – Nauset Estuary	181.51	136 gpd	136 gpd
Single Family Residential Wastewater Flow	90% of Water Flow = 128 gpd	128 – Rock Harbor 134 – Nauset Estuary	90% of Water Flow = 163.36	122 gpd	122gpd

Notes:

(1) The existing average annual wastewater flow estimates are based on the work and methodology of the MEP for the Rock Harbor estuary.

(2) Proposed assumptions are based on the detailed water demand projection used for the development of the Town's water system. For Residential/Commercial Class 130; water demand is based on average of 2.08 residents/household and 3.1 bedrooms/household. Water demand (i = 65 residential gallons per capita day (rgpcd)). Single family residential wastewater flow is estimated at 90% of water flow.

This is based on the following:

- The updated CCC 208 assumptions result in estimated wastewater flows that are about 28% larger than assumed in 2009 Eastham planning.
- When examining the estimated wastewater flows used as part of the MEP reports, the MEP values are closer to those used in 2009 Eastham planning. This flow information formed the basis of their nitrogen loading values, which the CCC 208 Plan bases their reduction requirement on as outlined in Appendix 8C of the 208 Plan.
- In addition, as part of the detailed water demand projections used for the development of the Town's water system, average water consumption was estimated at 136 gpd for residential properties based on 2.08 residents per household and 65 gallons of water use per residential capita per day.

3.2. Development and Landuse Comparison

Table 3 provides a parcel analysis by watershed and provides a comparison of the 2009 Eastham planning effort and updated watershed delineations provided by the MEP. This data was compiled using data extracted from CCCs 208 Planning Tool (MVP).

Table 3 Number of Parcels by Watershed in Eastham

Watershed	Sub-embayment	No. of Parcels – 2009 Eastham Planning Delineation[2]	No. of Parcels – CCC 208 Planning Tool	Change in Parcel Count (+/-)
Boat Meadow	Boat Meadow River	368	369	+1
Herring River (Eastham)	Herring River (Eastham)	427	414	-13
Rock Harbor	Rock Harbor	113	118	+5
Town Cove / Nauset Marsh[1]	Nauset Marsh	1,725	550	-160
	Nauset Stream/Mary Chase Gauge		288	
	Salt Pond		361	
	Town Cove		366	
Wellfleet Harbor	Wellfleet Harbor	668	517	-151
Total		**3,301**	**2,983**	**-318**

Notes:
(1) Total Number of Parcels in Town Cove / Nauset Marsh after summing for CCC 208 Watershed Tool column = 1,565.
(2) Parcel count based on existing developed and developable properties where water usage is expected to occur.

The changes, most significantly in Town Cove/Nauset Marsh and Wellfleet Harbor, represent the variation between the original CCC watershed boundaries and the revised/updated watershed delineations used in their 208 planning tools. This difference can be seen in Figures 3 and 4 with the two watersheds shown as an overlay comparison of the CCC delineation and the MEP watershed delineation for both Nauset Harbor Watershed (Figure 3) and the remaining Eastham watersheds (Wellfleet Harbor, Herring River, Boat Meadow and Rock Harbor). It was necessary to present the Nauset Harbor watershed separate from the other neighboring watersheds to effectively show increases and decreases in area. In locations where Nauset Harbor may have gained area/parcels by a shift in watershed delineation, Herring Pond for example may have lost area/parcels. As previously discussed in Section 2.2.1, the watershed delineations developed by the CCC changed based on model refinements and additional data from the USGS as part of the MEP Project.

Table 4 presents a breakdown of the landuse within these new watershed boundary areas in Eastham based on the data compiled as part of the 208 planning tool.

Table 4 Land Use by Sub-embayment in Eastham using CCC's 208 Planning Tool (1)

Watershed	Sub-embayments	% Residential	% Commercial	% Industrial	% Multi-Family Residential	% Other Development	% Residential Condo/Apt	% Vacant Non-Development
Boat Meadow	Boat Meadow River	93	1.5	-	4.5	1	-	-
Herring River (Eastham)	Herring River (Eastham)	97	-	-	2.25	0.5	0.25	-
Rock Harbor	Rock Harbor	86	-	-	8	3	1	2
Town Cove/Nauset Marsh	Nauset Marsh	76	10.5	7.25	5	0.25	1	-
	Nauset Stream(2)	92	-	-	6.5	0.5	1	-
	Salt Pond	71	10.75	8.25	7	1	2	-
	Town Cove	81	7.5	-	8	1.5	1.5	-
Wellfleet Harbor	Wellfleet Harbor	83	10	-	5.5	0.75	0.75	-

Note:
(1) Percentages rounded to nearest 0.25%
(2) Includes Mary Chase Gauge

As clearly shown in Table 4, the majority of each of these watersheds is residential; therefore the residential water assumptions (discussed in Section 3.1) can have a significant impact on nitrogen management strategies and the projection of nitrogen load generated in each watershed.

3.3 Nitrogen Loading Discussion

Table 5 presents a summary of existing wastewater flows and loads in Eastham; from the 2009 planning efforts to the updated CCC 208 planning efforts. The CCC 208 Planning Tool Wastewater Flow is extracted from the CCC's WatershedMVP tool. The unattenuated nitrogen loading calculation is presented in Appendix 8C: Sub-embayment Watersheds in the 208 Plan. For example, Rock Harbor is identified by the 208 Plan as having an unattenuated load of 2,558 kg. Eastham is identified as having a 21% responsibility; this is percent of controllable attenuated load that a town contributes to the watershed. By multiplying 2,558 kg x 21% the unattenuated nitrogen loading for Eastham is estimated. The reduction target and percent responsibilities are presented from the 208 Plan's Appendix 8C. The reduction target is multiplied by the percent responsibility to attain Eastham's estimated kilogram responsibility number as presented in the 208 Plan Appendix.

(continued on next page)

Table 5 Summary of Estimated Existing Wastewater Flows and Loads in Eastham

Major Watershed Areas [1]	2009 Eastham Planning Efforts		Updated CCC 208 Planning Efforts	
	Average Annual Wastewater Flow (mgd) [2][3][4]	Unattenuated Nitrogen Loading (kg/yr) [3][4]	CCC 208 Planning Tool Wastewater Flow (mgd) [5][7]	Unattenuated Nitrogen Loading (kg/yr) [6][7]
Rock Harbor Estuary	0.01	390	0.02	540
Nauset-Town Cove Estuary	0.22	7,900	0.24	11,400
Wellfleet Harbor	0.09	3,200	0.09	3,600
Herring River	0.05	1,700	0.06	2,600
Boat Meadow River	0.04	1,600	0.05	2,300
Atlantic Ocean Recharge Area	0.09	3,300	N/A	N/A
Cape Cod Bay Recharge Area	0.32	11,700	N/A	N/A
Total	**0.82**	**29,800**	**0.49**	**20,440**

Notes:

(1) Delineations for 2009 report were based on the work of the Cape Cod Commission and USGS with the exception of Rock Harbor Estuary which was delineated by the MEP.

(2) The existing average annual wastewater flow estimates are based on the work and methodology of the MEP for the Rock Harbor estuary.

(3) The wastewater nitrogen loading to the groundwater system associated with these existing flows were developed by MEP based on an average nitrogen concentration of 26.25 mg/L.

(4) Data shown is from Table 4-2 of the Final Interim Needs Assessment & Alternatives Screening Analysis Report.

(5) Based on the Cape Cod Commission value of 181.5 gpd in Table 2.

(6) Nitrogen loading is calculated by multiplying the unattenuated load value by the percent responsibility from the Eastham, Sub-embayment Watersheds located in Appendix 8C of the Cape Cod Area Wide Water Quality Management Plan Update.

(7) "N/A" = "Not Available" and is used when no information is available.

Table 5 provides a comparison of existing average annual wastewater flow from the 2009 Eastham planning effort to the CCC updated planning effort. The flow estimates developed for 2009 were based on the methodology of the MEP for their work on Rock Harbor estuary (referenced in Table 2 above). Flow estimates developed from the 208 planning process include a higher residential flow based on a Cape-wide average of 181.5 gpd as Eastham currently does not have Town water data. The cape-wide average flow of 181.5 gpd that is applied to Eastham is much higher than the 142 gpd applied by the MEP for Rock Harbor (and subsequently 148 gpd for Nauset Estuary) as identified in Table 2. This higher value will contribute to the differences in estimated wastewater flows and nitrogen loads associated with wastewater.

Figure 5 shows the MEP estimated percent removal required of controllable wastewater nitrogen and the percent responsibility of Eastham (Orleans and Brewster) for Salt Pond, Nauset Stream (including Mary

Chase Gauge), Town Cove and Rock Harbor based on the updated 208 Plan information. These estimated removals are summarized as follows:

- **Salt Pond** has an estimated 100% MEP removal percentage and Eastham has 100% of the responsibility of the controllable attenuated load to Salt Pond.
- **Nauset Stream** has an estimated 75% MEP nitrogen removal and Eastham contributes 100% of the controllable attenuated load.
- **Town Cove** being a shared watershed is more complex in that it has an estimated 75% MEP removal percentage but only 25% of the controllable attenuated load is what Eastham contributes, Orleans contributes 74% and Brewster contributes 1%.
- **Rock Harbor** is also a shared watershed and has a 78.8% MEP removal percentage and 21% of the controllable attenuated load is what Eastham contributes, Orleans contributes 79%.

However, the percent contributions are impacted by the method of calculating the nitrogen load to the waterbody. If the CCC 208 Plan method of estimating wastewater flow in Eastham is overly conservative, this results in an over estimate of nitrogen removal required. The following is presented as an example of this in the Salt Pond watershed.

The following table shows the estimated difference between the 208 Plan estimates and those developed by MEP in 2012.

Table 6 Salt Pond Nitrogen Loading Summary

Sub-embayment: Salt Pond	Unattenuated Load (kg)	Attenuated Load (kg)	MEP Threshold (kg)	Reduction target (attenuated – threshold) (kg)
208 Plan	2,930	1,990	434	1,556
MEP	2,330	1,700	434	1,266

Notes:
(1) 208 plan assumes 164 gpd per single family residential parcel
(2) MEP plan assumes 134 gpd per single family residential parcel

To further demonstrate this point if estimating unattenuated nitrogen load based on estimated number of residential parcels and converting that to an estimated nitrogen load, Table 7 summarizes this approach for Salt Pond.

Table 7 Salt Pond Single Family Residential Loading Estimates

Sub-embayment: Salt Pond	Estimated Single Family Residential Flow (gpd)	Estimated Unattenuated Residential Load (kg/yr)
208 Plan	42,000	1,530
Eastham 2015 Water (1)	31,400	1,140
Difference	10,600	390

Note:

(1) Flow estimates based on 122 gpd x estimated number of residential parcels. The estimated number of residential parcels is calculated from using the data for no. of parcels is Table 3 and multiplying it by the % residential in Table 4 for Salt Pond.

As shown in Tables 6 and 7, Eastham could be expected to remove 25% more nitrogen based on CCC 208 Plan higher water value.

Detailed evaluations and sensitivity analysis of flow data will be a part of the hybrid evaluations identified for Technical Memoranda Nos. 3 and 4 following receipt of additional water data from the Cape Cod Commission.

4. ESTIMATED NITROGEN LIMITS FOR TOWN COVE, SALT POND, AND ROCK HARBOR

The following discussion summarizes the current information presented in the 208 Plan and their estimates of nitrogen load and responsibility as previously discussed. Using their planning tool, flows and load estimates were aggregated. However, because of the significant difference in single family residential wastewater generation rate estimates, Eastham will consider a phased approach to managing their load. As part of this evaluation, it is proposed that Eastham will work towards wastewater nitrogen load management based on the 122 gpd estimated wastewater flow. However, through phasing and following the long-term modeling and monitoring, Eastham will consider the higher CCC 208 Planning numbers as an upper limit if nitrogen loading reductions do not achieve these levels based on the 122 gpd planning number. It is expected that the Adaptive Management Approach that will be developed and adopted by Eastham will address this as Eastham works to complete its planning efforts.

Tables 8 and 9 show the estimated existing wastewater flows and estimated future wastewater flows for each sub-watershed/sub-embayment area as part of the Project Focus Area. Flows and loadings are based on two different flow assumptions and will be considered as part of the Town's Adaptive Management approach in considering load removals to achieve future TMDL compliance.

Table 8 Estimated Existing Wastewater Flows

Sub-watershed	Estimated # of Parcels[6]	Eastham 2015 Est. [1][4]		CCC 208 Est.[4]	
		Estimated Existing Flows (gpd)	Estimated Existing Load (kg/y)	Estimated Existing Flows (gpd)	Estimated Existing Load (kg/y)
Town Cove Total	654	75,100	2,450	98,400	3,100
Town Cove	*366*	*45,800*	*1,700*	*58,100*	*2,110*
Mary Chase Gauge	*262*	*26,600*	*650*	*36,500*	*860*
Nauset Stream	*26*	*2,700*	*100*	*3,800*	*140*
Salt Pond Total[2][3]	361	60,600	1,350	70,800	1,580
Salt Pond	*247*	*26,900*	*1,000*	*35,400*	*1,280*
Ministers Pond[5]	*114*	*33,700*	*350*	*35,400*	*300*
Rock Harbor	118	8,000	300	12,200	440

Notes:

(1) Eastham estimates calculated based residential properties within watershed at 122 gpd per property vs the 208 Plan estimates of 163.36 gpd residential properties. All non-single family residential flows were assumed to be the same between each method.

(2) These values include both Eastham and the Cape Cod National Seashore.

(3) Less than 2% of the load from Depot Pond contributes to Salt Pond's load, therefore this sub-embayment was not included in this analysis but may be looked at during the hybrid evaluations.

(4) Attenuation (flow through %): Mary Chase Gauge (65%), Ministers Pond (29%)

(5) Need to review Ministers Pond loading with Cape Cod Commission to identify the additional removal represented in their values.

(6) As quantified in the CCC 208 Planning Tool "MVP."

(continued on next page)

Table 9 Estimated Future Wastewater Flows

Sub-watershed	Eastham 2015 Est.[1][5]		CCC 208 Est.[5]	
	Estimated Future Flows (gpd)	Estimated Future Load (kg/y)	Estimated Future Flows (gpd)	Estimated Future Load (kg/y)
Town Cove Total	91,500	2,900	114,800	3,630
Town Cove	*57,000*	*2,100*	*69,300*	*2,510*
Mary Chase Gauge	*31,600*	*720*	*41,500*	*980*
Nauset Stream	*2,900*	*100*	*4,000*	*140*
Salt Pond Total[2][3]	91,200	1,700	101,400	1,860
Salt Pond	*30,800*	*1,100*	*39,300*	*1,280*
Ministers Pond	*60,400*	*600*	*62,100*[4]	*580*
Rock Harbor	12,300	400	16,500	600

Notes:

1) Eastham estimates calculated based on residential properties within watershed at 122 gpd per property vs the 208 Plan estimates of 163.36 gpd residential properties. All non-single family residential flows were assumed to be the same between each method.
(2) These values include both Eastham and the Cape Cod National Seashore.
(3) Less than 2% of the load from Depot Pond contributes to Salt Pond's load, therefore this sub-embayment was not included in this analysis but may be looked at during the hybrid evaluations.
(4) The CCC 208 planning tool has identified large vacant developable properties with large flows assigned to the future.
(5) Attenuation (flow through %): Mary Chase Gauge (65%), Ministers Pond (29%)
(6) Need to review Ministers Pond loading with Cape Cod Commission to identify the additional removal represented in their values.

The impact of the higher water use will be considered in the sensitivity analysis that will need to be performed as part of the hybrid evaluations of Salt Pond and Town Cove, depending on the amount of non-traditional solutions considered within those watersheds depending on effectiveness of these approaches. As shown in Tables 8 and 9, the lower estimates are based on a lower single family residential flow as outlined in Table 2.

The Cape Cod Commission then developed their nitrogen loadings from these updated estimates and compared them to the MEP removal requirements (under their approach of addressing septic system loading). This data was then compiled on a sub-watershed basis and the contribution of each town was considered as part of their 208 Planning efforts. The same was then done by GHD for the Eastham flow estimates based on 122 gpd.

Appendix 8C in the 208 Plan Update provides a chart for sub-embayment watersheds and nitrogen responsibility by Town. The information below is extracted from that Cape Cod area wide visual and provides information on the sub-embayments of Wellfleet Harbor, Rock Harbor, Nauset, Boat Meadow and Herring River (Eastham) along with the percent contribution of each Town in that sub-embayment. For example, Eastham has 21% of the responsibility for Rock Harbor and Orleans has 79% of the responsibility. This

allocation (percent contribution) places a value on the nitrogen removal required in kilograms for each Town for each sub-embayment.

Wellfleet Harbor:

- Eastham = 11%
- Wellfleet = 88%
- Truro = 2%

Rock Harbor:

- Orleans = 79% & 100% Cedar Pond
- Eastham = 21%

Nauset:

- Orleans = 100% Mill Pond, 23% Nauset Marsh, 100% Rachel Cove, 74% Town Cove and 100% Woods Cove
- Eastham = 77% Nauset Marsh, 100% Nauset Stream, 100% Salt Pond and 25% Town Cove
- Brewster = 1% Town Cove

Boat Meadow:

- Orleans = 4%
- Eastham = 96%

Herring River:

- Eastham = 100%

Table 10 presents the watersheds discussed in 2009 and compares the estimated nitrogen load removals with those estimated by the 208 Planning efforts. The Existing Estimated Removal percentage in 2009 represents what was used for estimating the amount of nitrogen to be removed based on the information available at that time. Since that document was released, a draft MEP report for Nauset Estuary was released adjusting the watershed delineations and percent removals. When considering those and the CCCs allocation of responsibility, revised daily kilogram loads of nitrogen to be removed are presented in the last column under the estimated worst case condition if 163.36 gpd of wastewater is generated for each single family residence.

Table 10 Summary of Existing Removal Quantities and Percentages

Watershed	Sub-embayment	2009 Eastham Planning Effort		Updated 208 Planning Effort		
		Estimate of Existing Removal Requirements (%) [1][5]	Estimated Nitrogen Load to be Treated (kg/d)[1][5]	Existing Estimated Removal (%) [2]	Eastham's Responsibility of Watershed (%) [3]	Kilogram Responsibility (kg/d) [4]
Boat Meadow	Boat Meadow River	N/A	N/A	N/A	96%	N/A
Herring River (Eastham)	Herring River (Eastham)	N/A	N/A	N/A	100%	N/A
Rock Harbor	Rock Harbor	79%	0.84	78.8%	21%	0.93
Town Cove / Nauset Marsh	Nauset Marsh	55%	11.90	0%	77%	13.5
	Nauset Stream			75%	100%	
	Salt Pond			100%	100%	
	Town Cove			75%	25%	
Wellfleet Harbor	Wellfleet Harbor	N/A	N/A	N/A	11%	N/A

Notes:

(1) Estimated percentage of septic system nitrogen removal based on MEP report dated December 2008 for Rock Harbor (Final) and the Town of Orleans in their wastewater planning evaluations for Nauset Harbor.

(2) Estimated percentage of septic system nitrogen removal based on MEP reports dated December 2008 for Rock Harbor (Final) and May 2012 for Nauset Harbor (Revised Draft).

(3) Estimated by CCC of the total watershed load from Eastham in Appendix 8C of the Cape Cod Area Wide Water Quality Management Plan Update

(4) Estimated kg responsibility of the reduction target (Target load x % of Watershed Responsibility) form Appendix 8C of the Cape Cod Area Wide Water Quality Management Plan Update divided by 365 days/year.

(5) Data shown is from Table 4-5 of the Final Interim Needs Assessment & Alternatives Screening Analysis Report.

Based on the increased percent removals in Nauset/Town Cove estuaries, an increased nitrogen removal has been estimated by the CCC.

Figure 5 provides a depiction of the MEP required percentage removal required of controllable wastewater nitrogen and how it compares with Eastham's percent responsibility of the watershed.

5. SUMMARY OF UPDATED NEEDS ASSESSMENT AND NEXT STEPS

Based on the updated information for Town Cove and Rock Harbor and information developed by the CCC as part of the 208 planning process, the following revised areas of concern surrounding the Town Cove/Nauset Stream/Mary Chase Gauge, and Salt Pond/Ministers Pond and Rock Harbor will be the focus of the next steps of the process. The following table summarizes the estimated nitrogen removal loads based on the wastewater flow estimates discussed in Tables 8 and 9. Flows are not presented because alternative

technologies are being considered in Technical Memorandum No. 2 and therefore the flows to be treated will be developed in the hybrid solution evaluations as part of Technical Memoranda Nos. 3 and 4.

Table 11 Project Focus Area Removals for Existing and Future Nitrogen Loads using a Phased Approach

Estimated MEP % Removal	Sub-watershed	Estimated Minimum Wastewater Load to Remove (kg/y)[2][3]	Estimated Maximum Wastewater Load to Remove (kg/y)[1][3]
75%	**Town Cove Total**	**1,840**	**2,720**
	Town Cove	*1,280*	*1,880*
	Mary Chase Gauge	*490*	*740*
	Nauset Stream	*80*	*110*
100%	**Salt Pond Total**	**1,350**	**1,860**
	Salt Pond	*1,000*	*1,280*
	Ministers Pond	*350*	*580*
78.8%	**Rock Harbor**	**240**	**470**

Notes:
(1) Removal % needed is based on existing loads; all future loads beyond the existing load will need to be removed 100%.
(2) Minimum loads based on Eastham wastewater generation rate assumption of 122 gpd.
(3) Minimum value based on Eastham estimated residential flows and maximum based on CCC 208 MVP Tool estimates.

As discussed above there is a difference between wastewater flow estimates and therefore Table 11 provides a range of nitrogen removals. The minimum is based on existing conditions at 122 gpd per single family residence and the estimated maximum is based on the CCC 208 Planning tool as presented in Table 9 under future conditions. The evaluations done in subsequent tasks will take this into consideration when developing hybrid solutions.

Next steps of this project:

- Further evaluation of water use data to determine if the cape-wide average applied might affect Eastham's contribution. The flow data will be analyzed as part of the hybrid evaluations for Salt Pond and Town Cove to be developed in GHD's Technical Memoranda Nos. 3 and 4.
- Discussions with Orleans regarding their proposed approaches for Rock Harbor and Town Cove and alternative regional solutions. In addition, confirm that no traditional infrastructure regional solutions are being considered by Orleans at this time.
- Town Review of Technical Memorandum No. 1 findings.
- Town Review of Technical Memorandum No. 2: The purpose of this Technical Memorandum is to provide an update to the Alternatives Screening Analysis in order to guide the Town decision-making

in developing a revised/updated wastewater management plan and take into consideration additional information developed as part of the Cape Cod Commission 208 Planning process. Technical Memorandum No. 2 will follow a similar format to this document, and will summarize the following:

- Reconsideration of Alternatives screened in March 2009 Final Interim (Needs Assessment) & Alternatives Screening Analysis Report and the recommendations made as part of the 2009 Plan Evaluation Report.
- Additional nitrogen management concepts developed in the CCC 208 Plan.
- Background (book-end evaluations developed in the 208 planning project)
- Summary of feasible alternatives and proposed evaluation process for the project focus area
- Outline of the process of evaluating hybrid solutions for Salt Pond and Town Cove

- Newsletter: This newsletter will be prepared to summarize the findings of Technical Memoranda Nos. 1 and 2. This newsletter will be similar to what was prepared for the 2009 Wastewater Management Planning Project (attached in Appendix A).
- Compile new public water use data for three consecutive years.

List of Acronyms

ACRONYMS

208 Plan = Cape Cod Commission's Cape Cod Area Wide Water Quality Management Plan Update

CCC = Cape Cod Commission

CWMP = Comprehensive Wastewater Management Plan

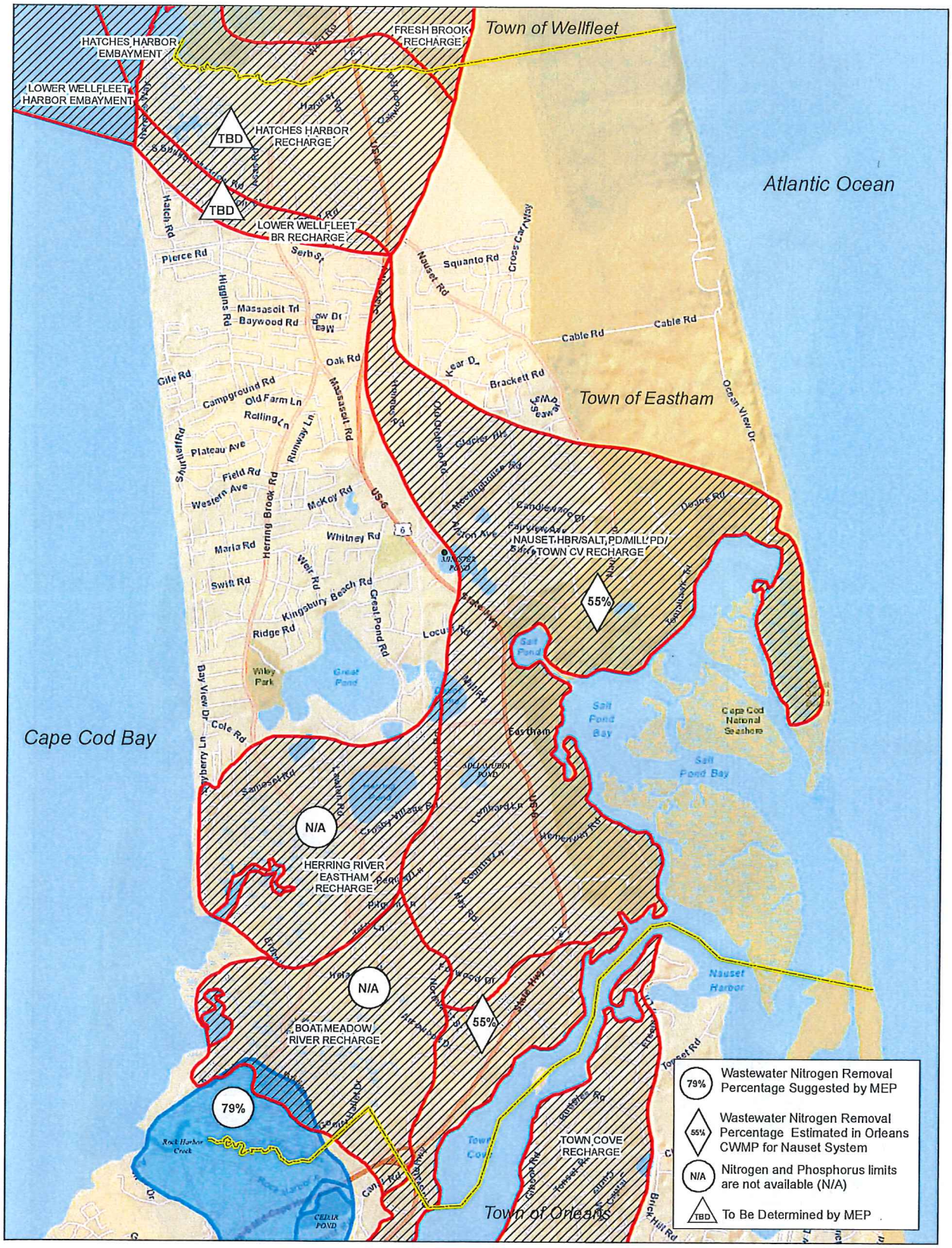
DRI = Development of Regional Impact (Cape Cod Commission)

MEP = Massachusetts Estuaries Project

MVP = Multi-Variant Planner (Watershed MVP); Cape Cod Commission's 208 Planning Tool

TWMP = Targeted Watershed Management Plan

Figures



LEGEND

Town Line

MEP Watershed

2009- Cape Cod Commission Watershed Delineation

Paper Size ANSI B

0 1,000 2,000 4,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

N

GHD

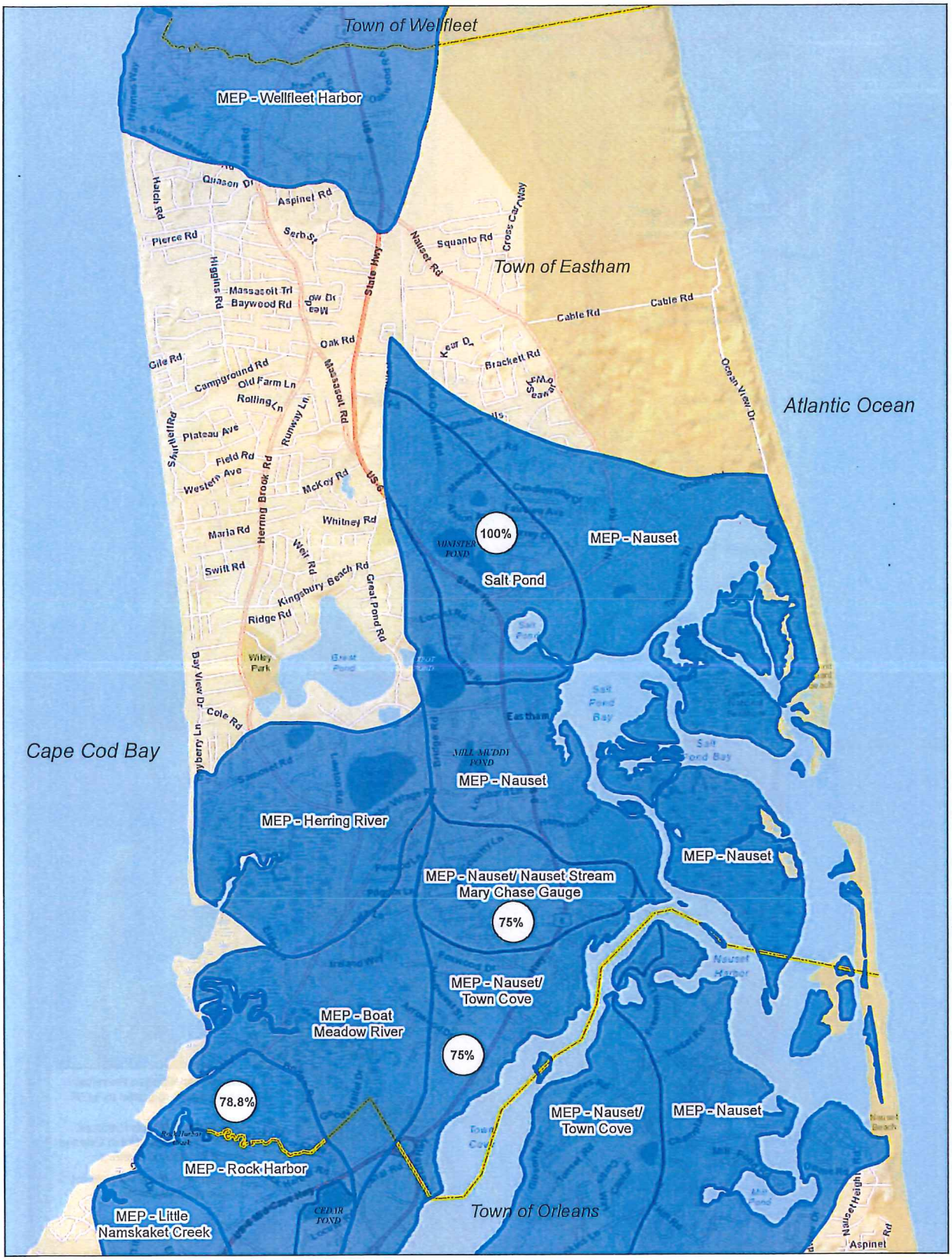
Town of Eastham, Massachusetts
Technical Memorandum #1

2009 Watershed Boundaries with Removal Percentages

Job Number 86-18665
Revision A
Date 17 Dec 2015

Figure 1

1545 Iyannough Road, Hyannis Massachusetts 02601 USA T 1 508 362 5680 F 1 508 362 5684 E hyamail@ghd.com W www.ghd.com



LEGEND

Town Line

Watershed Delineation

79% Wastewater Nitrogen Removal Percentage Suggested by MEP

Note 1.
Massachusetts Estuaries Project Linked Watershed-Embayment Approach to Determine Critical Nitrogen Loading Thresholds for Nauset Harbor Embayment System, Towns of Orleans and Eastham, Massachusetts, Revised Draft Report - May 2012

Massachusetts Estuaries Project Linked Watershed-Embayment Approach to Determine Critical Nitrogen Loading Threshhold for the Rock Harbor Embayement System Orleans, Massachusetts, Final Report - December 2008

Paper Size ANSI B

0 1,000 2,000 4,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

N

GHD

Town of Eastham, Massachusetts
Technical Memorandum #1

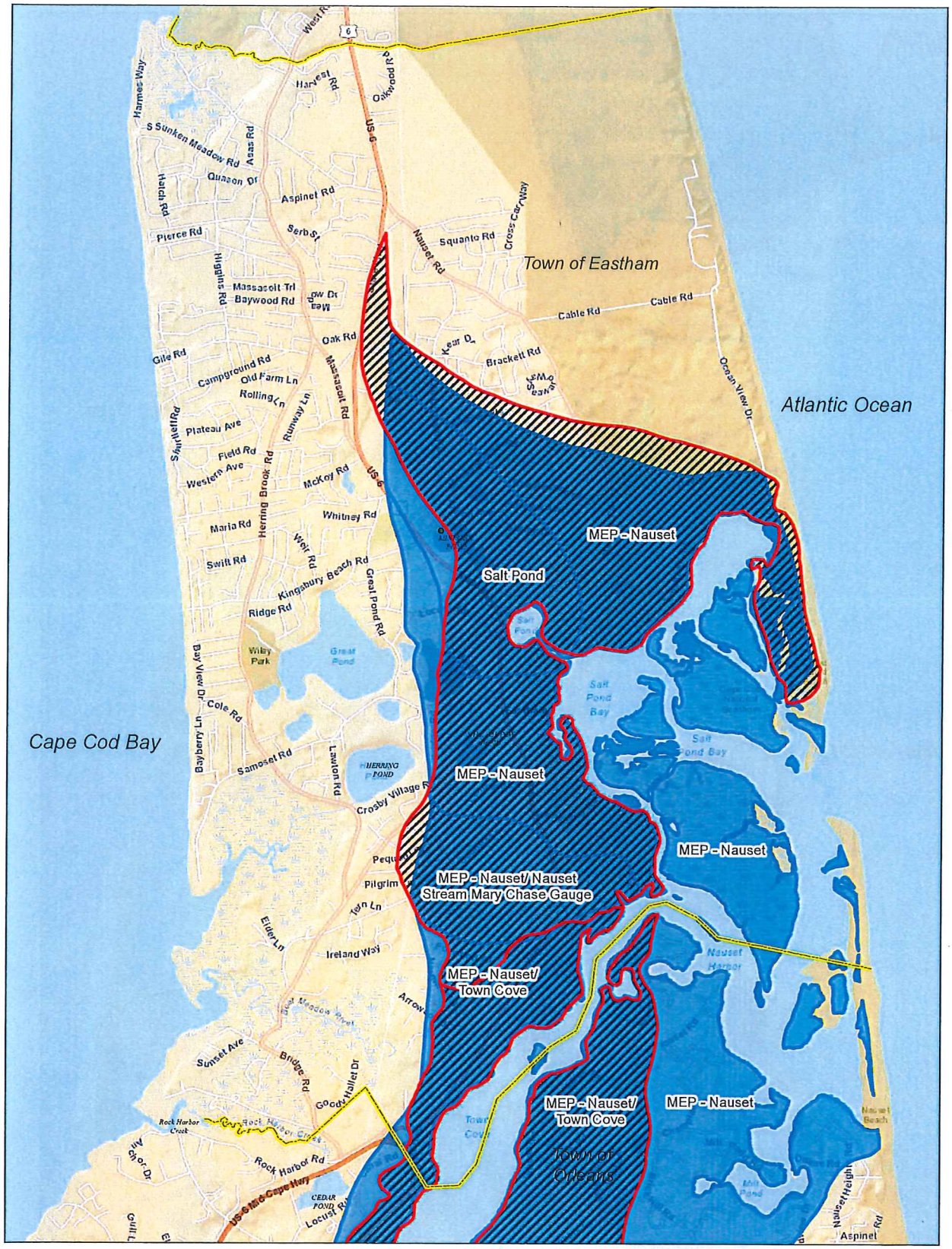
Updated Watershed Boundaries with Removal Percentages

Job Number 86-18665
Revision A
Date 23 Dec 2015

Figure 2

N:\US\Hyannis\Projects\86\18665\GIS\Maps\MXD_Deliverables\18665F02rev.mxd
1545 Iyannough Road, Hyannis Massachusetts 02601 USA T 1 508 362 5680 F 1 508 362 5684 E hyamail@ghd.com W www.ghd.com

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:jobrien



LEGEND

- 2009 Watershed Delineation - Nauset Harbor
- MEP Watershed Delineation - Nauset Harbor
- Town Line

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, Increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Paper Size ANSI B

0 1,000 2,000 4,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

N

GHD

Town of Eastham, Massachusetts
Technical Memorandum #1
Nauset Harbor Watershed Delineation Comparison - 2009 vs Current (2015)

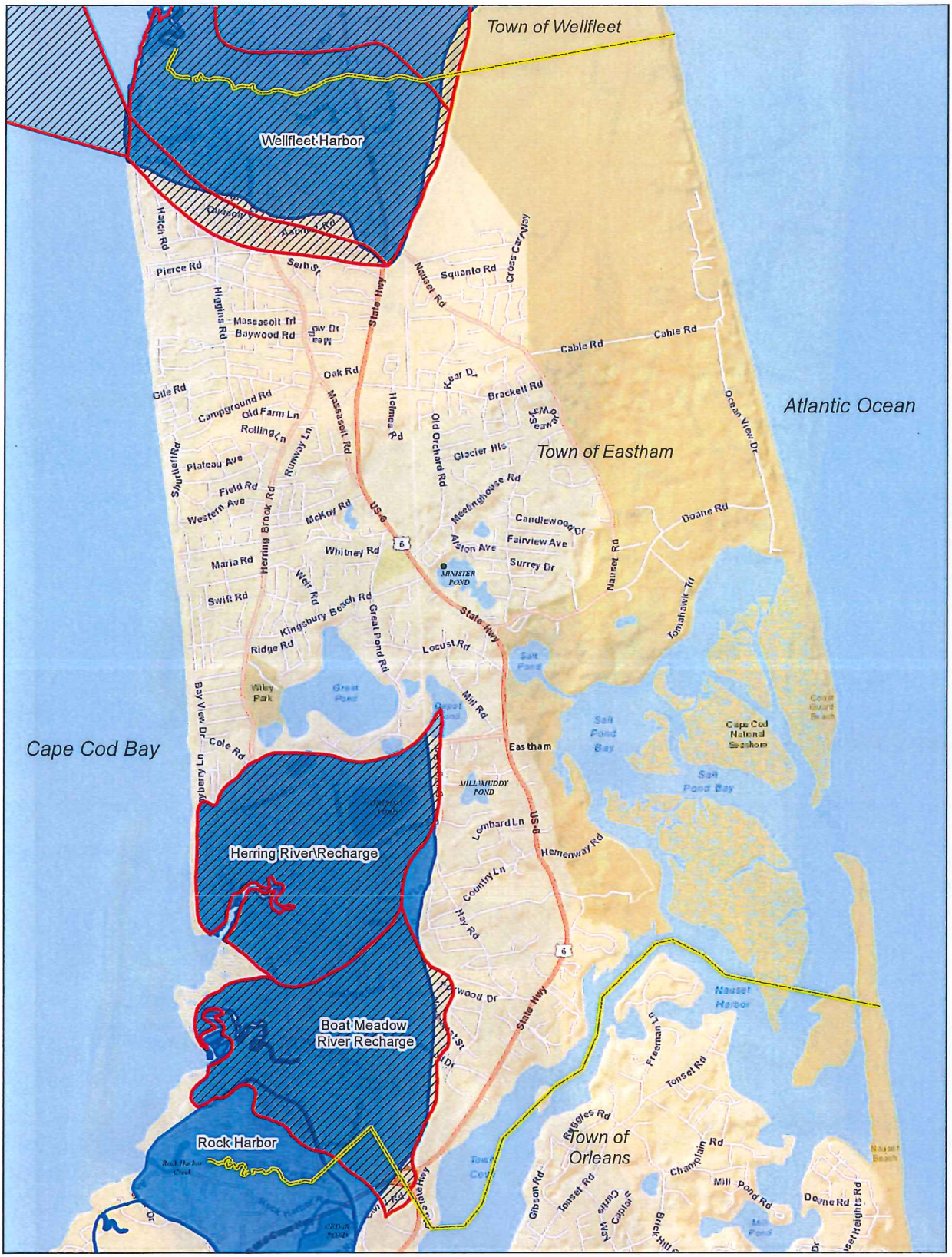
Job Number | 86-188665
Revision | A
Date | 23 Dec 2015

Figure 3

N:\US\Hyannis\Projects\86\188665\GIS\Mxds\MXD_Deliverables\188665FC3.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by: jgobrian

1545 Iyannough Road, Hyannis Massachusetts 02601 USA T 1 508 362 5680 F 1 508 362 5684 E hyamail@ghd.com W www.ghd.com



LEGEND

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, Increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

2009 Watershed Delineation for Herring River, Boat Meadow, Wellfleet Harbor & Rock Harbor

Updated Watershed Boundary for Herring River, Boat Meadow, Wellfleet Harbor & Rock Harbor

Town Line

Paper Size ANSI B

0 1,000 2,000 4,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

N

GHD

Town of Eastham, Massachusetts
Technical Memorandum #1

Wellfleet Harbor,Herring River, Boat Meadow & Rock Harbor Watershed Delineation Comparison - 2009 vs Current (2015)

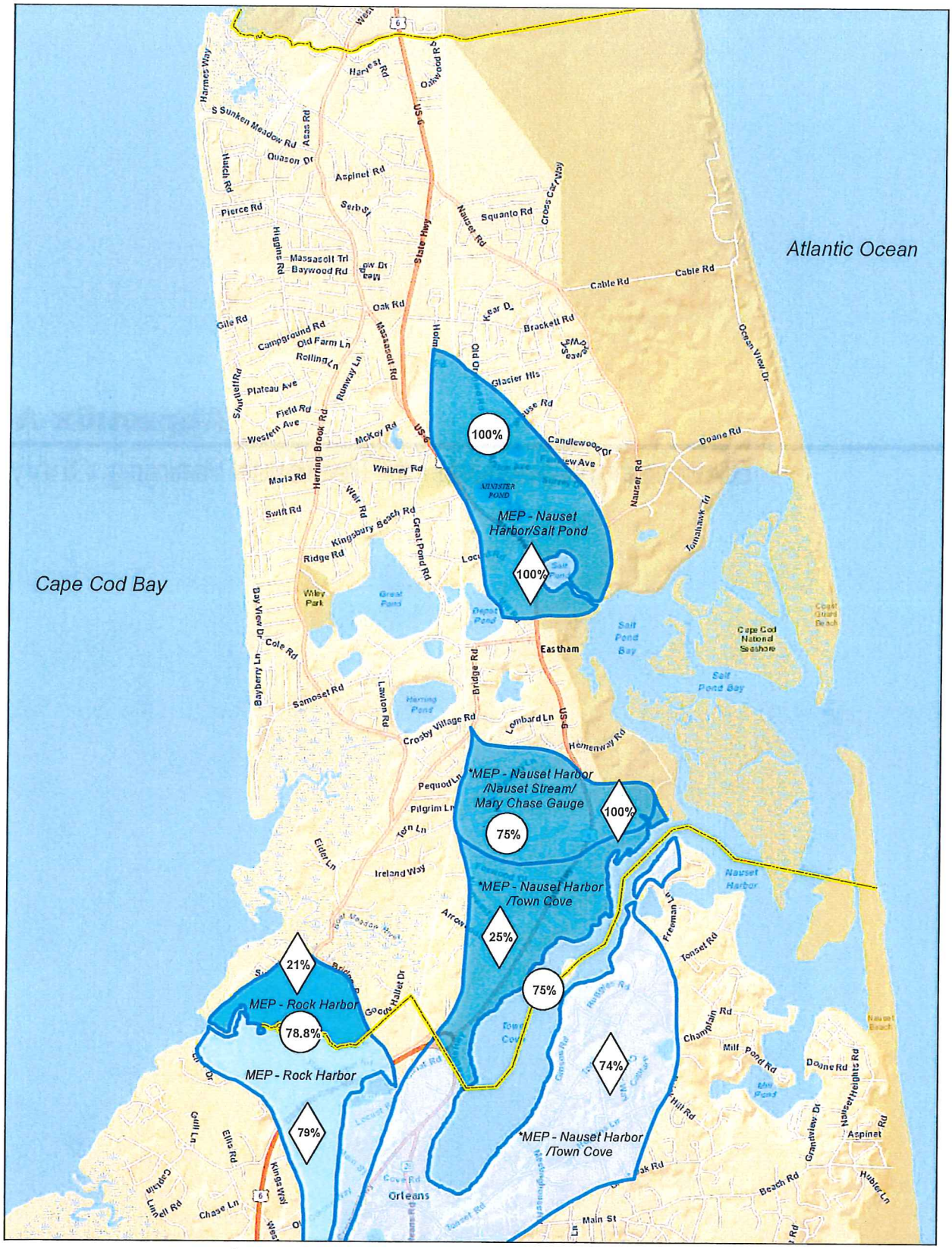
Job Number 86-188665
Revision A
Date 23 Dec 2015

Figure 4

N:\US\Hyannis\Projects\86\18665\GIS\Maps\MXD_Deliverables\18665F04revmxd

1545 Iyannough Road, Hyannis Massachusetts 02601 USA T 1 508 362 5680 F 1 508 362 5684 E hyamail@ghd.com W www.ghd.com

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by: jjobden



Legend

- Town of Eastham Watershed
- Town of Orleans Watershed
- Town Line
- 74% — Estimated Percent Responsibility of Controllable Attenuated Load by Town**
- 24% — Estimated Wastewater Nitrogen Removal %

*Note: 1% of the Nauset Harbor/Town Cove Nitrogen Removal Responsibility is Associated with the Town of Brewster as Estimated in the Cape Cod Commisiion 208 Plan, Appendix 8C

** Note: Based on Cape Cod Commissions Estimate in Appendix 8C of 208 Plan

Paper Size ANSI B

0 1,300 2,600 5,200 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

N

GHD

Town of Eastham, Massachusetts
Technical Memorandum #1

Job Number 86-18665
Revision 0
Date 09 Feb 2016

ESTIMATED NITROGEN REMOVAL PERCENTAGES AND PERCENT RESPONSIBILTY

Figure 5

N:\US\Hyannis\Projects\86\18665\GIS\Maps\MXD_Deliverables\18665F05.mxd

1545 Iyannough Road, Hyannis Massachusetts 02601 USA T 1 508 362 5680 F 1 508 362 5684 E hyamail@ghd.com W www.ghd.com

Appendix A

(Summary Newsletter of Previous Planning Only)

Town of

EASTHAM, MA

Wastewater Management Planning Project

EASTHAM MOVES FORWARD WITH WASTEWATER PLANNING

At the May 2008 Town Meeting, a detailed study to address the wastewater issues facing Eastham was approved and funded. This study was designed to focus on the following key questions

Should drinking water quality problems be addressed by treating wastewater or providing public water from a protected source?
How can the nitrogen loads to the Nauset/Town Cove and Rock Harbor Estuaries be reduced as specified by the Massachusetts DEP?
How can the water quality of the ponds be improved?

Efforts by the Town's consultant, Stearns & Wheler-GHD, to address these issues culminated in the Final Report entitled "Wastewater Plan Evaluation Report" dated May 2009 which is available at Town Hall and the Town's website: www.eastham-ma.gov.

The main findings and recommendations of that report are summarized in this newsletter.

Water and Wastewater Issues in Eastham

Two key factors summarize the Town's wastewater challenges:

1. Human Health Needs. Nearly all of the properties in Town are served by individual water supply wells and individual septic systems on the same lot. These private wells are becoming impacted by septic tank effluent and other land use activities (car washing, automotive storage, fertilizer application, pesticide use, etc.). The contamination is indicated by elevated nitrate levels detected in the wells. The nitrate levels that we are seeing in Eastham are not (by themselves) a serious human health threat to most of the population; but these levels do indicate the high probability that there is other contamination (viruses, volatile organic compounds, pharmaceuticals, phosphorus, etc.) in the drinking water. The probability that these contaminants are present in private wells does pose a potential health risk.

2. Environmental Health Needs. The groundwater system with its elevated nitrogen and phosphorus levels recharges into several coastal estuaries and freshwater ponds. The nitrogen acts as a fertilizer (nutrient) in the estuaries, as does phosphorus in the ponds. This "over fertilization" stimulates the growth of algae which, in turn, causes several water quality problems in these surface waters such as: loss of water clarity, excessive algal growth, loss of animal habitat and production of odors. State, Federal, and regional agencies are now setting nutrient limits (Total Maximum Daily Loads, also called TMDLs) on the amounts of nitrogen and phosphorus that are allowed to enter estuaries or ponds.

The watersheds of the Town's main surface waters are shown in **Figure 1**. Septic system discharges into the watersheds are the main sources of nitrogen and phosphorus to these water bodies. Evaluations indicate that the restoration and management of long-term water quality will require the removal of 55 percent of the current wastewater nitrogen discharges from the Nauset/Town Cove Estuary Watershed; 79 percent of such discharges from the Rock Harbor Estuary Watershed; and 100 percent of the current wastewater phosphorus discharges from the Freshwater Pond System Watershed. These are big reductions.

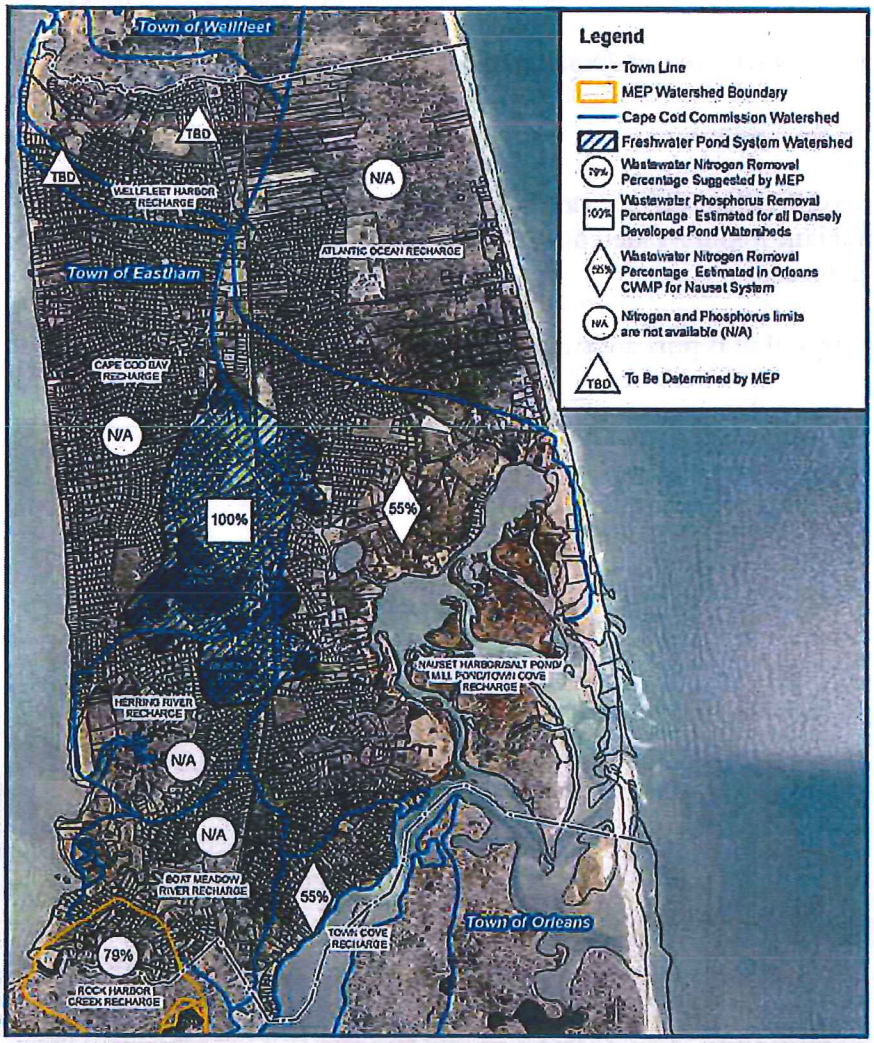


Figure 1. Watershed delineations and estimated wastewater nutrient reductions needed to address expected TMDLs.

Alternative Solutions Evaluated

All feasible technologies and management concepts were considered as possible ways to address the human health and environmental health needs, including: composting toilets, improved septic systems, community/cluster wastewater systems, alum treatment of the ponds, and individual treatment of private water supply wells. This work was completed in March 2009 and the evaluations were summarized in the Interim Needs Assessment and Alternatives Screening Analysis Report (also available at Town Hall and on the Town's website). These evaluations then selected the most feasible alternative solutions and formulated the group of Alternative Management Plans that were subsequently evaluated in the Plan Evaluation Report.

Alternative Solutions Evaluated (cont).

To address the **Human Health Needs**, the Town is currently evaluating the drinking water supply potential of two sources – new wells located in Eastham and the existing water system of the Town of Orleans. To ensure that the public's human health needs are met, drinking water has to be provided from a protected supply source. Time and cost factors indicate that wastewater treatment by itself is inadequate to address the human health concerns. It would take 30 to 50 years to see the beneficial effect of wastewater treatment on the well water quality; and the cost for a town-wide sewer and treatment system is estimated to be 4 to 5 times higher than that of Public Water Supply from a protected source.

To address the **Environmental Health Needs**, three alternative wastewater management plans were evaluated for each of the three watersheds. Considered were: 1) individual septic systems for nitrogen removal, 2) community/cluster wastewater systems for selected portions of the watershed, and 3) a more centralized sewer system leading to one wastewater treatment plant serving the selected portions of the watersheds. The study evaluated several possible wastewater treatment sites and revealed the Tri-Town septage Facility in Orleans to be the most suitable location. The study determined a joint sewer system with the Town of Orleans is the best option for the Nauset/Town Cove Estuary Watershed and, possibly, for the Rock Harbor Watershed. (Additional nitrogen work is still needed for Rock Harbor.) Alum treatment of the ponds is the lowest cost and most effective way to address phosphorous loadings to the ponds.

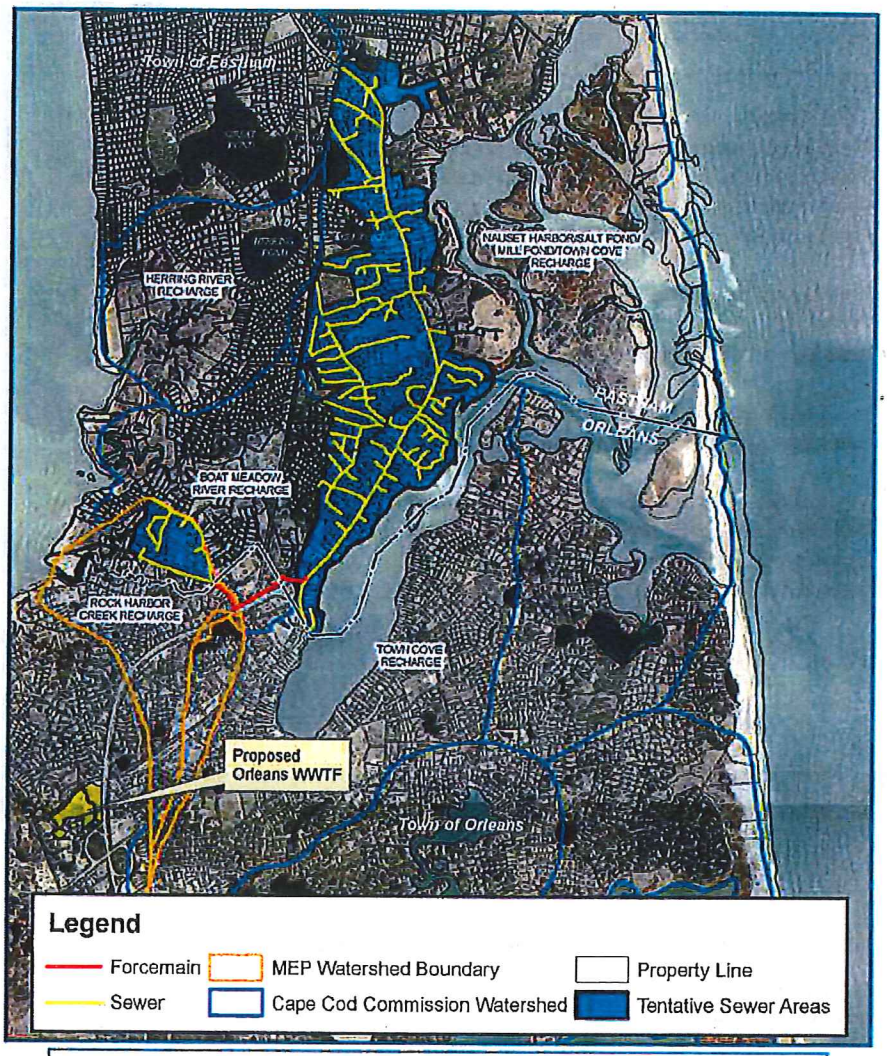


Figure 2. Tentative sewer areas needed to address expected nitrogen TMDLs.

Cost Estimates For the Plans

An important conclusion of this planning project is that Town-wide wastewater treatment is not needed. The Town's environmental health needs can be met by partial sewering of selected watersheds.

The Public Water Supply System for the whole Town is estimated to have a capital cost of $80 million.

Costs for a Wastewater Management System to address the environmental health needs are as follows.

- The sewer installations for the portions of the Nauset/ Town Cove Estuary and Rock Harbor Estuary Watersheds (see Figure 2) have an estimated capital cost of $60 million.
- If all the ponds in the freshwater pond system watershed were to be treated at one time, the cost would be approximately $1 million. But this type of treatment is typically applied over a long period of time, and some of the ponds may not need extensive management.
- Annual costs to individual property owners will need to be estimated once funding and cost distribution decisions have been developed by the Town.
- Typically, the capital costs for these systems are not paid solely by the properties in the watersheds or their sewered sections, but are shared by the whole Town.

Recommended Next Steps

The Town is proceeding quickly with the Drinking Water Supply planning and implementation activities because the human health need is so clear. There is more time to plan and budget for the recommended approaches to meet the environmental health needs.

Based on the main findings of this planning project, the following next steps are recommended to address the human health and environmental health wastewater needs.

- Continue to coordinate with the Town of Orleans as they complete their Wastewater Regionalization Study.

- Continue to coordinate with MassDEP as they finalize the nitrogen limits for Nauset/Town Cove Estuary and Rock Harbor Estuary, and determine their willingness to consider alternative methods to meet the limit for Rock Harbor.

Town of Eastham Comprehensive Wastewater Management Planning Project
Health Department
2500 State Highway
Eastham, MA 02642-2544

Appendix B

Stantec

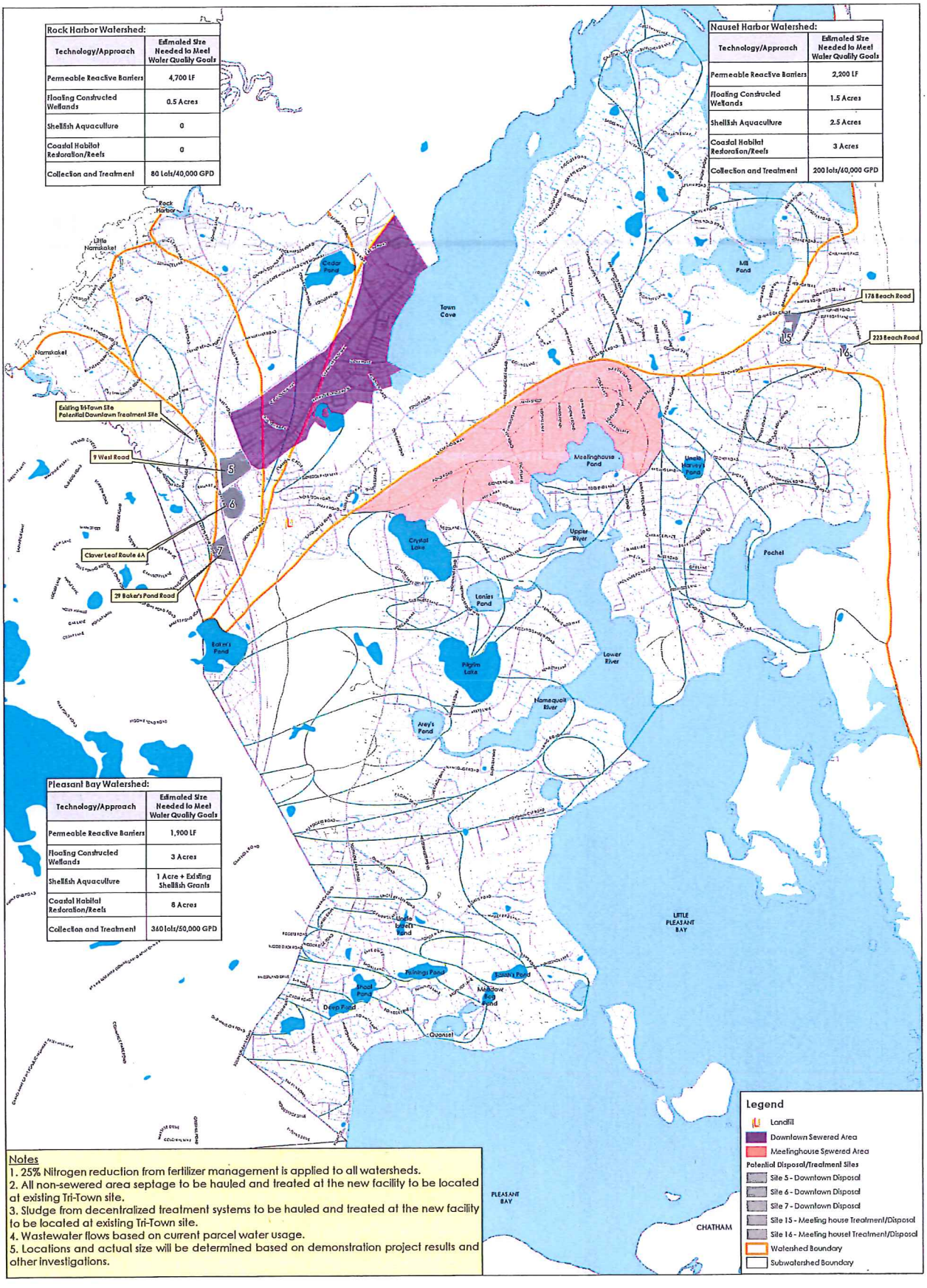
CONCEPTUAL APPROACH TO MEET ORLEANS WATER QUALITY GOALS

TOWN OF ORLEANS
MASSACHUSETTS

MARCH, 2015

N

0 600 1,200 2,400 3,600 4,800
Feet



Notes
1. 25% Nitrogen reduction from fertilizer management is applied to all watersheds.
2. All non-sewered area septage to be hauled and treated at the new facility to be located at existing Tri-Town site.
3. Sludge from decentralized treatment systems to be hauled and treated at the new facility to be located at existing Tri-Town site.
4. Wastewater flows based on current parcel water usage.
5. Locations and actual size will be determined based on demonstration project results and other investigations.

Orleans Water Quality Advisory Panel
Consensus Agreement of the OWQAP
March 11, 2015*

The Orleans Water Quality Advisory Panel, or OWQAP, was convened to guide studies and assessments, define preferred approaches, seek consensus and build widespread community support for a customized, affordable water quality management plan for the Town of Orleans. The panel consists of **stakeholder representatives** (Orleans Selectmen and representatives of engaged citizen constituencies), and **liaisons** from key town boards and commissions, organizations, neighboring towns, and regional, state, and federal partners. It is staffed and assisted by Water Resources Associates, Stantec and its consultants, and the Consensus Building Institute (CBI).

The OWQAP has met for twelve half-day meetings since July 2014, all of which were open to public attendance and comment. After examining a broad range of options, the Panel has reached agreement on a set of principles and some key elements of an Amended Water Quality Management Plan (the Plan) and associated Adaptive Management Plan[1]. This Agreement includes and requires successful completion of the steps described here to resolve uncertainties and confirm key elements, such as treatment and disposal site suitability and availability, development of demonstration sites for non-traditional (NT) technologies, and further work to find an equitable distribution of costs necessary to the development of an acceptable and executable engineering plan that adheres to the key elements.

Agreed Goals and Objectives:

1) The Plan seeks to improve water quality in Orleans' natural water systems, meet nitrogen reduction targets and other key requirements of local, regional, State and Federal regulators, including finalized and preliminary TMDLs, while supporting updating of the analysis of current water quality conditions and MEP model runs. The Plan includes flexibility within an adaptive management framework to allow changes in the implementation plan to respond to any new findings from these updated analyses and resolution of other uncertainties.

2) In addition to needed nitrogen reduction, the Plan seeks to control phosphorous impacts on freshwater systems, address sanitary requirements, and respond to commercial and residential wastewater needs. The Plan also seeks to restore natural ecosystem services[2] using in-situ NT water quality solutions that offer rapid restoration, improve water and sediment quality, and restore habitat health.

3) The Plan also seeks affordability and fairness in its distribution of costs, by developing a detailed Financial Plan for allocations of costs, as well as a commitment to working together to identify and pursue all sources of grants and other financial support.

Agreed Plan Approach and Key Elements:

4) Given the potential benefits of NT technologies for removing nitrogen and phosphorous and providing valuable ecosystem services with more rapid results and at lower cost than traditional collection systems, the intent of the Plan is to maximize the use of Coastal Habitat Restoration[3] (CHR), Aquaculture[4], Floating Constructed Wetlands[5] (FCW), Permeable Reactive

---

[1] This Plan will amend the approved CWMP approved by the Cape Cod Commission and MassDEP in 2011.

[2] Natural symbiotic processes conducted by one species and benefitting other(s).

[3] Creating habitats including shellfish reefs (such as the oyster reefs created in Wellfleet) that restore natural ecosystem services in the water body. The shellfish remove nitrogen from the water, and a bio-diverse ecosystem of many other species also contribute to nitrogen reduction. The reefs support young fish, crabs and other bottom dwelling animals, and sustain or restore the submerged aquatic vegetation (SAV) and benthic conditions necessary for natural habitat functions.

Barriers[6] (PRBs) and other approaches (e.g., inlet management) as strategies for meeting water quality goals. While there are risks and much to learn about these technologies, the *Conceptual Approach to Meet Orleans Water Quality Goals Map* estimates technologies and sizes within each watershed that could reasonably be implemented to help meet TMDLs and water quality needs. If fully successful, this could include realizing up to two-thirds of the Town's nitrogen reduction using NT technologies. A first phase of work to further evaluate the effectiveness, costs, risks, and opportunities for these NTs will be to select, design, and implement a series of demonstration projects. The findings from demonstration projects will be used to determine locations and areal extents of NT solutions, as well as their expected costs and contributions to nitrogen and phosphorous removal goals.

5) The Plan reduces the sewered footprint (area of town and number of properties to be sewered) to a minimum by maximizing the use of the non-traditional technologies referenced above. The Conceptual Approach delineates two footprints within Orleans for implementation of sewers. These areas include 1) ~280 parcels encompassing Downtown Orleans (~100,000 GPD), to be treated at a new treatment plant located at the Tri-Town site and disposed at one of several prospective sites nearby (potentially also using a reclaimed water system), and 2) ~360 parcels within the Meetinghouse Pond sub-watershed (~50,000 GPD), to be treated at a satellite treatment facility and disposal area to be identified. These areas were designated for wastewater collection and treatment because their nitrogen reduction requirements and wastewater needs could not be met using only NT technologies. The Downtown area includes numerous properties with aging and/or non-compliant systems and inadequate nitrogen reduction, which cannot be cost effectively retrofitted to meet current wastewater needs. Certain newer facilities may be "grandfathered" for some limited period of time. Options utilizing small cluster plants downtown were found not to have an economic advantage and the additional complexity involved in ownership, operation and maintenance of several small plants was a significant disincentive. Satellite or cluster treatment plants are valid wastewater treatment options in the appropriate circumstances and will be evaluated for other locations within Orleans.

6) In Meetinghouse Pond watershed, 100% nitrogen removal is required. Technology performance limitations and land use constraints in Meetinghouse Pond prevent deployment of sufficient NT solutions to meet those needs. The Plan includes siting a satellite treatment plant for the Meetinghouse Pond watershed.

7) The new treatment facility will be designed to treat septage from the towns currently served by the existing Tri-Town Septage Treatment Plant, as well as the wastewater from the downtown Orleans area only. Septage storage and treatment capacities will be evaluated for appropriate sizing, to avoid competition based on tipping fee / price. This will allow the town to continue to meet the septage treatment needs of the businesses and residents of Orleans and the Lower/Outer Cape, while generating net positive revenue that will lower customer rates in Orleans. Revenues from septage treatment will be allocated to those parties who contribute to the capital cost and Orleans will seek compensation for providing nitrogen treatment and disposal for flows from out-of-town customers.

---

[4] Shellfish farming: the shellfish are filter feeders that remove nitrogen form the water system. The shellfish are harvested for market.

[5] Floating structures filled with plants that use nitrogen and other nutrients from the water to grow.

[6] PRBs intercept groundwater before it reaches the coastal water system and provide the necessary conditions for the conversion of nitrogen compounds to harmless nitrogen gas. The process is called denitrification.

8) The Plan includes an Adaptive Management Plan (AMP), which will provide a detailed approach to monitoring the success and efficacy of each component of the Plan and a framework and methodology for evaluating and adjusting solutions over time, with back-up technologies (including possibly additional sewering) to ensure compliance with regulatory requirements for water quality. The AMP will also provide for continued coordination with regulatory agencies to confirm compliance of the Plan with monitoring standards and water quality requirements, and continued monitoring of the financial and economic impacts of the plan on residents and businesses of Orleans. The AMP will also provide a framework for selecting, implementing and evaluating NT demonstration projects to refine initial assumptions about effectiveness, cost, and other implementation considerations. The *Conceptual Approach to Meet Orleans Water Quality Goals* will be updated and refined based on information developed through demonstration projects and other studies and analyses.

9) The Plan and AMP will seek to capitalize upon opportunities for potential management synergies and cost savings through cooperation with Orleans' neighboring towns of Eastham and Brewster.

OWQAP Commitment:

10) By agreeing to these principles and key features of an Amended Water Quality Management Plan, OWQAP Stakeholder Representatives endorse the goals, objectives, approach, and key elements as described above, and commit to support Warrant Articles, By-laws, and other Town measures to pursue and implement the Plan and its underlying principles. Representatives also agree to inform and engage their full stakeholder groups and related constituencies about these components and principles.

11) OWQAP Stakeholders also agree to work to refine and implement Adaptive Management in a manner consistent with these principles and with the Plan, and to work collaboratively to address challenges encountered in the process of resolving uncertainties in the Plan and to work collaboratively to finalize an executable engineering plan that is consistent with the principles of the Plan.

CONSENSUS of the Orleans Water Quality Advisory Panel is defined in their approved Operating Protocols as unanimous concurrence of the Stakeholder Representatives, representing their constituencies. Members may also "abstain." Abstaining means not offering consent or endorsement, but also not blocking an agreement. Abstaining members are not counted in determining if consensus has been reached.

Sims McGrath, Orleans Selectman
Alan McClennen, Orleans Selectman
David Dunford, Orleans Selectman
Jon Fuller, Orleans Selectman (in absentia)
Judith Bruce, on behalf of the Former CWMP Committee
Dale Fuller, on behalf of the Orleans Taxpayers Association
Jim McCauley, on behalf of the Orleans Pond Coalition
Sid Snow, on behalf of the Orleans Chamber of Commerce
Jeff Eagles, on behalf of the Orleans Water Alliance
Doug Fromm, on behalf of Orleans CAN
Peter Haig, on behalf of the Orleans Community Partnership
Abstention by Mark Fiegel, on behalf of the Citizens Peer Review Committee

TECHNICAL MEMORANDUM NO. 2

February 10, 2015

To	Town of Eastham		
Copy to	Jane Crowley		
From	Jessica Janney	Tel	774-470-1636
	Anastasia Rudenko, P.E., ENV SP		774-470-1637
	J. Jefferson Gregg, P.E., BCEE		774-470-1640
Subject	Eastham Wastewater Management Plan Update to Wastewater and Nitrogen Management Alternatives Screening Analysis	Job No.	8618665

1. INTRODUCTION AND SCOPE

The Town of Eastham has been developing a Wastewater Management Plan since 2007 and completed its Interim Needs Assessment Report (NAR) and Alternatives Screening Analysis (ASAR) Report in March 2009; and Wastewater Management Planning Project Plan Evaluation Report in June 2009. As a result of these efforts, the Town's wastewater plan in 2009 included the following recommendations:

1. Development of a public water supply system that draws water from a protected source to address septic-system wastewater impacts on individual private water supplies.
2. Development of a Ponds Action Plan and remediation of the Town's ponds that are most impacted from eutrophication (excessive algal growth) caused by excessive phosphorus loading to the ponds from several sources including wastewater.
3. Development of a wastewater collection system to collect wastewater from the Nauset-Town Cove Estuary, and Rock Harbor watersheds for treatment and discharge at the Tri-Town Septage Treatment Plant site in association with the Orleans wastewater management plan.

This planning effort was completed before nitrogen limits were fully developed for the Nauset Estuary (including Town Cove and Salt Pond) and Rock Harbor. The original approach of the recommendations was also based on the Orleans planning efforts and discussion of a regional solution at the Tri-Town facility site.

The purpose of this Technical Memorandum is to provide an update to the Alternatives Screening Analysis in order to guide the Town decision-making in developing a revised/updated wastewater management plan; to take into consideration additional information developed as part of the Cape Cod Commission (CCC) 208 Planning process; and changes in the Town of Orleans planning approach to addressing their nitrogen loading to Town Cove and Rock Harbor.

GHD Inc. 1545 Iyannough Road Hyannis MA 02601 USA
T 1 774 470 1630 **F** 1 774 470 1631 **E** hyamail@ghd.com **W** www.ghd.com

This Technical Memorandum No. 2 follows a similar format to Technical Memorandum No. 1, which provided an update of the 2009 Interim Needs Assessment. The memorandum will summarize the following:

- Reconsideration of Alternatives screened in March 2009 Final Interim (Needs Assessment) & Alternatives Screening Analysis Report and the recommendations made as part of the 2009 Plan Evaluation Report.
- Additional nitrogen management concepts developed in the CCC 208 plan.
- Background (book-end evaluations developed in the 208 planning project).
- Summary of feasible alternatives and proposed evaluation process for the Project Focus Area.
- Outline of the process of evaluating hybrid solutions for Salt Pond and Town Cove.

2. BACKGROUND

2.1. Previous Findings of Eastham's Wastewater Planning Project Related to Coastal Estuaries and Nitrogen Mitigation

The Alternatives Screening Analysis Report, which was completed in 2009, evaluated available technologies and management concepts, and recommended a short list of alternative management plans for further evaluation. These plans were identified for each of the target areas presented in 2009: Rock Harbor, Nauset Estuary/Town Cove, and the Freshwater Ponds as shown in Figure 1. The dark blue hatched area represents the estimated watersheds to the freshwater ponds.

Each of the plans are summarized below (not including those related to recommendations for a Town-wide water system to protect public health and the freshwater pond treatments, both of which have undergone some level of implementation in Town):

A. Alternative Wastewater Management Plans for the Rock Harbor Watershed:

1. Rock Harbor Watershed Plan 1. This plan included the following components:
   - Sewer extension to the properties in the watershed, the extent of which is displayed in Figure 2.
   - Construction of a new community/municipal wastewater treatment facility at the Roach Property site in Northern Eastham. The property is outlined in red in Figure 2.

   This alternative was contingent on the availability of an acceptable treatment and recharge site and could be part of a long-term management and remediation plan for Rock Harbor.

2. Rock Harbor Watershed Plan 2 **(Recommended as part of the 2009 planning efforts)**. This plan included the following components:
   - Sewer extension to the properties in the watershed, the extent of which is displayed in Figure 2.
   - Connection of this sewer system to the Orleans Wastewater Treatment Facility (WWTF) proposed to be constructed at the Tri-Town Facility site.

This alternative plan was contingent on available capacity at the proposed Orleans WWTF and an inter-municipal agreement between the two towns.

3. Rock Harbor Watershed Plan 3. **(Recommended as part of the 2009 planning efforts)**. This plan would be further evaluation of ideas introduced by Brian Howes of MEP for possible aeration and dredging management of Rock Harbor. This type of management may be possible for Rock Harbor because it is not a natural estuary; it is a tidal creek that is continually dredged to maintain a boat basin. The feasibility of this plan is unknown and would require additional evaluation, possibly as a MassDEP pilot study.

Plan 2 and Plan 3 were both recommended in the 2009 Plan Evaluation Report. Plan 3 is the preferred alternative but needs to be discussed with MassDEP to determine if a lower nitrogen limit is warranted (due to Rock Harbor being a dredged boat basin) and if the limit could be met through alternative dredging or aeration methods. If Plan 3 cannot be implemented, Plan 2 becomes the recommended alternative management plan for this estuary.

B. Alternative Wastewater Management Plans for the Nauset-Town Cove Watershed:

1. Nauset-Town Cove Estuary Watershed Plan 1. This plan included the following components:
   - Sewer extension to the properties in the watershed, the extent of which is displayed in Figure 2.
   - Construction of a new community/municipal wastewater treatment facility at the Roach Property site in Northern Eastham. Outlined in red in Figure 2.
2. Nauset-Town Cove Estuary Watershed Plan 2. **(Recommended as part of the 2009 planning efforts)**. This plan included the following components:
   - Sewer extension to the properties in the watershed, the extent of which is displayed in Figure 2.
   - Connection of this sewer system to the Orleans Wastewater Treatment Facility proposed to be constructed at the Tri-Town Facility site.
3. Nauset-Town Cove Estuary Watershed Plan 3. This plan included the following components:
   - Individual on-site systems approved by MassDEP for nitrogen removal supported by an expanded Town Health Department to enforce operation, maintenance, and discharge compliance which would be completed by the property owner.

C. Alternative Wastewater Management Plans for the Freshwater Pond System Watersheds:

1. Freshwater Pond System Watershed Plan 1. This plan included the following components:
   - Sewer extension to the properties in the watershed, the extent of which is displayed in Figure 2.
   - Construction of a new community/municipal wastewater treatment facility at the Roach Property site in Northern Eastham. The property is outlined in red in Figure 2. These

components would be the same as previously discussed in the Rock Harbor Watershed Plan 1 and Nauset-Town Cove Estuary Watershed Plan 1

2. Freshwater Pond System Watershed Plan 2. This plan included the following components:
   - Sewer extension to the properties in the watershed.
   - Connection of this sewer system to the Orleans Wastewater Treatment Facility proposed to be constructed at the Tri-Town Facility site.
3. Freshwater Pond System Watershed Plan 3 **(Recommended as part of the 2009 planning efforts)**. This plan included periodic treatment of the ponds that exceed threshold levels being developed by the Cape Cod Commission.

In addition to the plans summarized above the following Best Management Practices for Town-wide application were recommended as part of all of the plans:

- Fertilizer use education to minimize over-fertilization.
- Stormwater management practices on Town and State roadways as well as at individual homes.

2.2. Town of Orleans CWMP Project

The Town of Orleans CWMP was initially completed in December 2010 with the submission of their Comprehensive Wastewater Management Plan and Single Environmental Impact Report (CWMP/SEIR) by Wright-Pierce. This plan was reviewed under and approved by the Massachusetts Environmental Protection Act (MEPA) review as summarized in the January 28, 2011 MEPA Certificate, and approved by the Cape Cod Commission in their October 31, 2011 Development of Regional Impact (DRI) decision. These three documents are located on the Orleans Town Web site at http://www.town.orleans.ma.us/water-quality-advisory-panel/pages/cwmpwastewater-archives.

The Orleans CWMP/SEIR provides discussion on the opportunity for regionalization of wastewater management with Eastham and Brewster after the first three phases of the Orleans core program[1].

There have been several additional planning efforts to identify additional and/or different wastewater and nutrient management approaches in Orleans as identified on the Town's Web site. The most recent effort was a series of evaluations using the 208 planning methods developed by the Cape Cod Commission. These evaluations and the resulting Town decision-making process resulted in a group of agreed upon goals, objectives, plan approaches, and commitments that are summarized in a March 2015 Consensus Statement (attached in Appendix B of Technical Memorandum No. 1). This document identifies the following next steps:

- Continue evaluations of a group of non-traditional nutrient management technologies which include Coastal Habitat Restoration, Aquaculture, Floating Constructed Wetlands, Permeable Reactive Barriers, and Water Body Inlet Management.

[1] Orleans CWMP/SEIR, Executive Summary page ES-4.

- Continue evaluation of the following two wastewater treatment concepts:
  - Sewer system development for a group of approximately 280 parcels (estimated flow of 100,000 gallons per day) in downtown Orleans with treatment (co-treatment with septage) at a new treatment facility at the Tri-Town facility; treated-water recharge to be at a site remote from the Tri-Town site.
  - Sewer system development for a group of approximately 360 parcels (estimated flow of 50,000 gallons per day) in the Meeting House Pond sub-watershed. Treatment and treated-water recharge to be at one or more sites to be designated.

The Orleans spring Town Meeting appropriated funds for FY2016 to proceed with these evaluations. The evaluations and subsequent pilot studies are expected to require more than one year to complete. As part of this most recent planning effort in Orleans, no reference was made to regionalization outside of continuing to accept septage from communities that are currently served by the existing Tri-Town Septage Treatment Plant.

2.3. Cape Cod Commission 208 Planning

The Cape Cod Commission has finalized their 208 Plan update for Cape Cod (CCC 208 Plan) which brings many new wastewater planning components to a municipal wastewater planning process, such as Eastham's, including:

- Identification of Waste Management Agencies (WMA) that will work to share responsibility to meet the nitrogen TMDLs for coastal estuaries.
- Development of Watershed Reports for each watershed within Town boundaries.
- New wastewater management evaluation tools to estimate existing and future wastewater flows and nitrogen loading as well as alternative wastewater nitrogen management scenarios.
- The requirement to complete a Targeted Watershed Management Plan (TWMP) for estuaries and their watersheds that exceed established nitrogen TMDLs.
- Revised regulatory procedures to streamline the review process once a TWMP is properly completed.
- Recommendations to MassDEP to develop a watershed permitting program to allow nitrogen removal credits for traditional as well as non-traditional management techniques to meet a nitrogen TMDL.
- County support to develop individual TWMPs.

The Plan is awaiting final approval from USEPA in September, however towns are encouraged to use this tool; therefore the next steps of Eastham's wastewater management planning project will utilize many of these components. Towns will be expected to file watershed reports in a format presented by the CCC in June 2015. These reports are anticipated to be submitted to the CCC within one year of that date.

3. ADDITIONAL NITROGEN MANAGEMENT CONCEPTS DEVELOPED IN THE CCC 208 PLAN

The CCC 208 Plan includes a Water Quality Technologies Matrix which outlines technologies and approaches for nutrient management. The plan categorizes 67 nutrient reduction, remediation and restoration technologies and approaches into 10 categories. A description of the technologies considered is also provided in the plan.

Table 1 provides a comparison of the technologies discussed in 2009 ASAR and the CCC 208 Plan, a summary of the 2009 ASAR recommendation on whether the alternative should be retained for further evaluation and an updated recommendation. Updated recommendations will be discussed further in Section 4.

As shown in the table, the majority of 208 approaches were considered as part of previous Eastham evaluations. However, as adaptive management approaches are considered in the future for reducing nutrient loadings to the Town's watersheds, the originally considered technologies—in addition to some of these non-traditional approaches currently being piloted and implemented regionally—can be considered in the future. Legislation changes in Massachusetts have also opened the possibility of ocean outfall as an alternative for treated effluent disposal. However this is still a very involved process that would require extensive siting and studies and permitting to determine its feasibility for use and therefore would only be considered as a last resort and more of the "soft" solution approaches should be considered in earlier phases.

Table 1 Comparison of Technologies Discussed in the 2009 ASAR and the CCC 208 Plan

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
Green Infrastructure	Natural Treatment Systems: • Constructed Wetlands for Nitrogen Attenuation • Hydroponic systems	• Constructed Wetlands – Surface Flow – Subsurface Flow – Groundwater Treatment • Hydroponic Treatment • Phytoirrigation • Phytoremediation	Not included in the Alternative Wastewater Management Plans (WMAs) selected for detailed evaluation.	It is recommended that these approaches be retained as part of an adaptive management program and may be considered for further evaluation and practical opportunities as more data on their viability becomes available through regional piloting and DEP guidance.
	Stormwater Best Management Practices: • Subsurface leaching pits • Vegetated swales or basins • Constructed wetlands	Stormwater Best Management Practices: • Phytobuffer • Vegetated Swale • Gravel Wetland • Bioretention/Soil Media Filters • Constructed Wetlands	Recommended for Town-wide implementation as part of all the WMAS selected for detailed evaluation.	Recommended for Town-wide implementation as part of all the WMAS selected for detailed evaluation.

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
Innovative and Resource Management Technologies	Shellfish Aquaculture/ Propagation was not evaluated in the 2009 efforts	Aquaculture: • Shellfish cultivated in Estuary Bed • Shellfish Cultivated Above Estuary Bed • Mariculture	Not evaluated.	Several Cape Cod communities are piloting aquaculture projects – including Orleans, Mashpee and Falmouth. It is recommended that the results of these pilot and planning projects be reviewed and that this alternative be retained for further evaluation. Discussions with the Town have indicated that there may be opportunities within Salt Pond and Town Cove.
	Nitrate Barrier Wall	Permeable Reactive Barriers (PRBs): • Trench Method • Injection Well Method	Not included in the WMAs selected for detailed evaluation.	The Town of Orleans is planning to implement a PRB pilot. It is recommended that the results of this pilot project be reviewed and that this alternative be retained for further evaluation.
	Fertigation Wells were not evaluated in the 2009 efforts	Fertigation Wells: • Turf • Cranberry Bogs	Not evaluated.	It is recommended that this approach be retained as part of an adaptive management program and may be considered for further evaluation and practical opportunities as more data on their viability becomes available through regional piloting and DEP guidance.
Waste Reduction Toilets	Toilets: • Composting • Incinerating • Waterless • Urine Diverting	Toilets: • Composting • Incinerating • Packaging (waterless) • Urine Diverting	Not included in the WMAs selected for detailed evaluation.	Not recommended for further evaluation for large scale application as homeowner/property owner acceptance of this may be limited. However it is recommended that these systems be retained as part of an adaptive management program and may be considered for further evaluation if practical opportunities present themselves and be available to those property owners willing or interested in converting to these types of systems.
	Tight Tanks	Not identified as part of the 208 Planning efforts.	Not included in the WMAs selected for detailed evaluation.	Recommended for use only where allowed/approved by MassDEP, and only on a temporary basis until a long term solution is found.

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
Non-Structural Approaches	Reduction of Wastewater loadings • Eliminating garbage grinders • Reducing pharmaceutical load in wastewater	Not specifically addressed as part of the current 208 Plan, however, CECs and other potential contaminates are part of the greater effort to protect the Cape's water resources.	Not included in the WMAs selected for detailed evaluation.	It is recommended that all non-structural approaches be included in the recommended plan.
	Fertilizer reduction	Fertilizer Management	Recommended for Town-wide implementation as part of all the WMAS selected for detailed evaluation.	
	Landscape design practices	Not specifically addressed in 208 Plan	Not included in the WMAs selected for detailed evaluation.	
	Animal waste management	Not specifically addressed in 208 Plan	Not included in the WMAs selected for detailed evaluation.	
	Stormwater management and treatment	Stormwater BMPs	Recommended for Town-wide implementation as part of all the WMAS selected for detailed evaluation.	
	Modified Zoning	Nutrient Reducing Development Compact and Open Space Development Transfer of Development Rights	Not included in the WMAs selected for detailed evaluation.	
System Alternatives	Improved tidal flushing	Inlet/Culvert Widening	Not included in the WMAs selected for detailed evaluation.	Further evaluation for improved tidal flushing and/or watershed modification at the Rock Harbor boat basin to lower needed wastewater nitrogen removals from the watershed is recommended.
	Coastal Habitat Restoration was not evaluated in the 2009 efforts	Coastal Habitat Restoration	No evaluated.	The Town of Orleans is planning to implement a coastal; restoration pilot. It is recommended that the results of this pilot project be reviewed and that this alternative be retained for further evaluation.

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
	Floating Constructed Wetlands were not evaluated in the 2009 efforts	Floating Constructed Wetlands	Not evaluated.	The Town of Orleans is planning to implement a floating constructed wetland pilot. It is recommended that the results of this pilot project be reviewed and that this alternative be retained for further evaluation.
	Pond Treatment	Pond and Estuary Circulators	Not included in the WMAs selected for detailed evaluation.	It is recommended that the alternatives recommended in the Town of Eastham's Pond Action Plan, dated December 2011, continue to be implemented. Treatments to Herring Pond and Great Pond were completed. Town has continued with its dredging program for Rock Harbor.
		Surface Water Remediation Wetlands	Not included in the WMAs selected for detailed evaluation.	
		Chemical Treatment of Ponds	Recommended for further evaluation as part of Freshwater Pond System Watershed Plan 2.	
		Pond and Estuary Dredging	Dredging was recommended as part of Rock Harbor Plan 3.	
On-Site Treatment Systems	Title 5 Septic Systems	Title 5 Septic System Replacement (Base Line Condition)	Not evaluated as standard systems remain part of the nutrient problem to pond and estuaries.	Due to the low nitrogen and phosphorus removal rates of Title 5 septic systems this alternative is not recommended for further evaluation in nutrient sensitive areas.
	• JET Aerobic Wastewater Treatment • Orenco Intermittent Filter	• Innovative/Alternative (I/A) Systems • Innovative/Alternative (I/A) Enhanced Systems	Recommended for further evaluation as part of Nauset-Town Cove Estuary Watershed Plan 3.	I/A technologies are only considered for the Nauset-Town Cove Estuary and for the Rock Harbor Estuary for I/As that achieve a total effluent wastewater nitrogen concentration of 5 mg/L or less based on future flows. I/A selection would be up to the discretion of the homeowner to choose the appropriate MassDEP approved technology.
	• Recirculating Sand Filters (Non-Proprietary Filters • RUCK® System • Bioclere • Micro-, High Strength-, Nitri- and Modular-FAST • Waterloo Biofilter • Advantex® • NITREXTM System • SeptiTech System			

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
	• Norweco Singulair • Cromaglass System • Omni Recirculating Sand Filter • Bio Barrier MBR WWT System • NITREXTM Plus			
Treatment Systems	• Rotating Biological Contactors • Sequencing Batch Reactors • Amphidrome • Membrane Bioreactor • MicroFAST, High Strength FAST, NitriFAST and Modular FAST Systems • Bioclere	• Cluster Treatment System – Single Stage • Cluster Treatment System – Two Stage	Not recommended as part of 2009 evaluations.	Recommended to be retained for further consideration in areas that do not need treatment to 3 mg/L, the highest degree of performance
	• Activated Sludge with Modified Ludzack-Ettinger (MLE) Process • Rotating Biological Contactors • Sequencing Batch Reactors • Membrane Bio-Reactor • Oxidation Ditches • Aerated Biological Filters • Denitrification Filters • Technologies Used to Achieve Less than 3 mg/L Total Nitrogen • Adsorption • Advanced Oxidation Technologies	• Conventional Treatment • Advanced Treatment	Recommended for further evaluation as part of Rock Harbor Watershed Plan 1, Nauset-Town Cove Estuary Plan 1 and Freshwater Pond System Watershed Plan 1.	Due to the high costs, complex controls and need of supplemental processes, Aerated Biological Filters are not considered for further evaluation. The remaining secondary/advanced treatment technologies screened for larger (community/municipal) WWTFs are recommended to be retained for further consideration.

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
	• Precipitation • Ion Exchange • Breakpoint Chlorination • Membrane Filtration • Technologies to Remove Endocrine Disrupters • Phosphorus Technologies			
	• Disinfection Technologies • Ozone • Ultraviolet Radiation		UV disinfection recommended for further evaluation as part of Rock Harbor Watershed Plan 1, Nauset-Town Cove Estuary Plan 1 and Freshwater Pond System Watershed Plan 1.	UV recommended for use based on previous evaluations regarding disinfection.
	• Rotating Biological Contactors • Sequencing Batch Reactors • Amphidrome • Membrane Bioreactor • MicroFAST, High Strength FAST, NitriFAST and Modular FAST Systems • Bioclere	• Satellite Treatment • Satellite Treatment - Enhanced	Recommended for further evaluation as part of Rock Harbor Watershed Plan 1, Nauset-Town Cove Estuary Plan 1 and Freshwater Pond System Watershed Plan 1.	Recommended to be retained for further consideration in areas that do not need treatment to 3 mg/L, the highest degree of performance.
Collection Systems	Gravity Sewer	Gravity Sewer	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 & 2, Nauset-Town Cove Estuary Watershed Plans 1 & 2 and Freshwater Pond System Watershed lp.	Recommended that all collection technologies be retained for further consideration/
	Pressure sewers with grinder pumps	Low Pressure Sewer	Recommended for further evaluation as part of Rock Harbor	

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
			Watershed Plans 1 & 2 and Nauset-Town Cove Estuary Watershed Plans 1 & 2.	
	Vacuum Sewer	Vacuum Sewer	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 & 2 and Nauset-Town Cove Estuary Watershed Plans 1 & 2.	
	Force Main	Force Main	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 & 2 and Nauset-Town Cove Estuary Watershed Plans 1 & 2.	
	Pump Station	Pump Station	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 & 2 and Nauset-Town Cove Estuary Watershed Plans 1 & 2.	
		On-Site Pump Station	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 & 2 and Nauset-Town Cove Estuary Watershed Plans 1 & 2.	
	Septic Tank Effluent Gravity (STEG) System	STEG- Collection	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 & 2 and Nauset-Town Cove Estuary Watershed Plans 1 & 2.	
	Septic Tank Effluent Pump (STEP) System	STEP - Collection	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 and Nauset-Town Cove Estuary Watershed Plans 1.	

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
Effluent Disposal	Sand Infiltration Beds	Effluent Disposal – Infiltration Basins	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 and Nauset-Town Cove Estuary Watershed Plans 1.	With the exception of ocean outfalls it is recommended that all treated water recharge technologies be retained for further evaluation. Ocean outfalls may be considered based on the shift in regulations, and may be considered as a final resort if effluent recharge facility sites are unavailable.
	Subsurface Infiltration	Effluent Disposal – Soil Absorption System (SAS)	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 and Nauset-Town Cove Estuary Watershed Plans 1.	
	Spray Irrigation		Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 and Nauset-Town Cove Estuary Watershed Plans 1.	
	Drip Irrigation		Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 and Nauset-Town Cove Estuary Watershed Plans 1.	
	Well Injection	Effluent Disposal – Injection Well	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 and Nauset-Town Cove Estuary Watershed Plans 1.	
	Wick Well Technology	Effluent Disposal – Wick Well	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 and Nauset-Town Cove Estuary Watershed Plans 1.	
	Wetland Restoration		Recommended for further evaluation as part of Rock Harbor	

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
			Watershed Plans 1 and Nauset-Town Cove Estuary Watershed Plans 1.	
	Ocean Outfall	Effluent Disposal – Ocean Outfall	Not evaluated.	
	Regional recharge facilities	Effluent Transport out of Watershed to Recharge, Reuse Facility or Ocean Outfall	Recommended as part of a regional solution with Orleans in 2009	
Solids Processing	Septage Processing	Septage Processing	Recommended for further evaluation as part of Rock Harbor Watershed Plans 1 & 2 and Nauset-Town Cove Estuary Watershed Plans 1 & 2.	Disposal at the Tri-Town Septage Treatment Facility in Orleans recommended for continued use.
	• Sludge Thickening and Disposal at a Regional Facility • Sludge Dewatering and Disposal at a Regional Facility	Commercial Disposal • Dewater and Haul to Landfill • Incineration	Commercial disposal of thickened sludge recommended for further evaluation as part of Rock Harbor Watershed Plans 1 & 2 and Nauset-Town Cove Estuary Watershed Plans 1 & 2.	Disposal of thickened sludge believed to be the most practical sludge disposal alternative and is recommended.
	Sludge Dewatering, Composing and Distribution to the Public	Composting	Not included in the WMAs selected for detailed evaluation.	Land area for building requirements will be either site restrictive or cost prohibitive therefore it is not recommended for further evaluation.
	Alkaline Stabilization	Lime Stabilization	Not included in the WMAs selected for detailed evaluation.	Alkaline stabilization typically not cost effective for small sludge flows in areas where there is not a market for the final product. Due to the lack of an agricultural market on Cape Cod this alternative is not recommended for further evaluation.
	Digestion	Digestion	Not included in the WMAs selected for detailed evaluation.	Not cost effective for small flows – not recommended for further evaluation.
	Heat Treatment and Drying	Thermal Drying	Not included in the WMAs selected for	Process generally has high capital costs, high level of complexity, high

	Technologies Considered in the 2009 ASAR	Technologies Considered in CCC 208 Plan	2009 ASAR Recommendation	Updated Recommendation
			detailed evaluation.	energy usage and operations and is usually poorly received by the public due to air emissions. Usually not cost effective for small flows. Not recommended for further evaluation.
		Drying and Gasification	Not included in the WMAs selected for detailed evaluation.	Process generally has high capital costs, high level of complexity and high energy usage. Not recommended for further evaluation.

4. RECONSIDERATION OF ALTERNATIVES SCREENED IN MARCH 2009 FINAL INTERIM (NEEDS ASSESSMENT) & ALTERNATIVES SCREENING ANALYSIS REPORT

It is recommended that as a result of the potential shift in regional options with Orleans on traditional infrastructure that components of these 2009 alternative wastewater management "plans" be reevaluated as part of the "Hybrid" alternative solutions development discussed at the end of this document. With regards to Rock Harbor Watershed Plan 2 and Nauset-Town Cove Watershed Plan 2 (which were the recommended plans identified in 2009 Plan evaluation report), it is recognized that the 'Orleans Water Quality Advisory Panel Consensus Agreement of the OWQAP March 11, 2015' states that the Town of Orleans is currently proposing to design a new treatment plant capable of treating septage from the towns currently served by the Tri-Town Septage Treatment Plant and wastewater only from downtown Orleans. Even though the facility is currently proposed to only treat wastewater from Orleans, the Town of Eastham continues to be interested in pursuing an inter-municipal agreement to connect to the Orleans Wastewater Treatment Facility if capacity were available. It is recommended that further discussion on this regional approach and other non-traditional regional approaches continue with the Town of Orleans.

In addition to the alternatives developed in the 2009 ASAR it also recommended that non-traditional nutrient mitigation technologies be considered for further evaluation as part of the hybrid approaches to address nitrogen loading to Salt Pond and Town Cove. These technologies include:

- Natural treatment systems
- Shellfish aquaculture/propagation
- Permeable reactive barriers (PRB)
- Fertigation wells
- Non-structural approaches
- Improved tidal flushing
- Coastal habitat restoration

- Floating constructed wetlands

While generally regarded as experimental technologies and not as well defined in terms of predictable performance as a more conventional system, the technologies listed above are being proposed as pilot studies in the neighboring Town of Orleans and other Cape Cod communities. If a suitable application is identified for these technologies in the Town of Eastham, it is recommended that pilot data be analyzed to determine whether the technology should be retained for further evaluation.

The Town submitted to the USEPA the Salt Pond Visitor Center site as a possible location for PRB site characterization as part of a grant opportunity through USEPA. Although the funding source could not be applied to this location, it remains a potentially viable pilot opportunity and will be actively included as part of the hybrid evaluations for Salt Pond.

In addition, the Town has had preliminary discussions with former and existing staff familiar with shellfish opportunities within the Town (specifically Town Cove and Salt Pond). The Town currently has existing open shellfish beds and shellfish grant holders within the Town Cove watershed. Because of the high salinity levels, it is likely that these would support chowder quahogs (similar to approaches in Mashpee to use quahogs versus oysters being used in other parts of Mashpee, Falmouth, and Wellfleet). The existing estuary bottom could support these efforts. There are also opportunities in the Town Cove Flats for regional solutions with Orleans; and Orleans has identified shellfish as an approach they are going to further evaluate.

Oyster reefs are unlikely based on the high possibility of predation. Further discussion is recommended with the Town's Natural Resource Officer and Department of Public Works regarding these approaches as part of a hybrid solution.

The Town has also recently performed dredging within the Rock Harbor basin as part of long-term management of that waterbody. The Town should consider additional data evaluation within this waterbody to see if any measurable improvement might be obtained as discussed previously.

5. BACKGROUND (BOOKEND) EVALUATIONS DEVELOPED IN 208 PLANNING PROJECT

Bookend evaluations have been developed by CCC for Nauset Harbor, Town Cove, and Salt Pond. A bookend evaluation compares the two spectrums of a nutrient management solution—one comprised completely of traditional infrastructure and one entirely made up of non-traditional technologies. The CCC developed these bookends so that communities can use this data to develop a hybrid solution that utilizes both traditional and non-traditional mitigation measures.

The bookend evaluations are conducted using the CCC Tracker model. Nitrogen removal targets for each sub-watershed in Tracker are based on the targets listed in the Massachusetts Estuary Project (MEP). This approach is slightly different than the GIS based approach that has been typically used by most communities to determine buildout potential and resulting future wastewater flows and nutrient loadings.

The Tracker model uses nutrient removal assumptions for a defined set of technologies to model how the potential effectiveness of a technology (or combination of technologies) may be in the area of interest. The CCC Tracker model uses regional water use averages for the development of water flow data in the Town of

Eastham, since the Town does not currently have a Town-wide public water system. The buildout potential for a region is based on a Massachusetts-wide zoning layer compiled for the Commonwealth of Massachusetts Executive Office of Environmental Affairs (EOEA) buildout, which was prepared in 2014. The following technologies are considered traditional infrastructure technologies in Tracker:

- Fertilizer Reduction
- Stormwater Reduction
- Gray Infrastructure (wastewater collection, treatment, and recharge)

The following technologies are considered non-traditional solutions:

- Permeable Reactive Barriers
- Constructed Wetlands (No Collection)
- Constructed Wetlands (With Collection)
- Coastal Habitat Restoration
- Phytobuffers
- Fertigation (turf)
- Fertigation (bogs)
- Floating constructed wetlands
- Surface water remediation wetland
- Phytoremediation
- Aquaculture
- Eco-toilets
- Urine-diversion (UD)
- I/A Systems
- Enhanced I/A Systems
- Enhanced Attenuation

CCC has developed several non-traditional bookend solutions for Nauset Harbor (which includes Town Cove and Salt Pond) and Rock Harbor, based on the vast number of choices one could make in using non-traditional solutions. However these evaluations are based on the entire watershed and include impacts from both Eastham and Orleans as they relate to the Nauset System and Rock Harbor.

Two non-traditional bookend alternatives developed by CCC for Nauset Harbor are outlined in Table 2. The Tracker model calculates the quantities (linear feet, areas, number of properties served, number of systems, etc.) of different technologies needed to meet a nutrient mitigation goal. The quantities can be input to the 208 Map Viewer (which was also developed by CCC) to determine proposed locations for the technologies. An example of the 208 Map Viewer output for Nauset Harbor is shown in Figure 3. Further studies would be

needed to determine the optimal locations for these technologies based on variables that are not included in the 208 Map Viewer, such as site suitability and public acceptance.

Table 2 Nauset Harbor Bookend Evaluation Alternatives

Technology	Quantity	
	Bookend Example #1	Bookend Example #2
Fertilizer Management	50% removal	25% removal
Stormwater Mitigation	50% removal	25% removal
Permeable Reactive Barrier	16,675 linear feet	16,675 linear feet
Fertigation - turf	10 acres	--
Floating Constructed Wetlands	2,500 cubic feet	--
Ecotoilets (UD and compost)	27 homes	--
UD School or Public Facility	402 people	--
I&A Systems	60 homes	--
Enhanced I&A Systems	3 homes	--
Unattenuated Load Remainder	109 homes	1,661 homes

Two non-traditional bookend alternatives developed by CCC for Rock Harbor are outlined in Table 3.

Table 3 Rock Harbor Bookend Evaluation Alternatives

Technology	Quantity	
	Example Bookend #1	Example Bookend #2
Fertilizer management	25% removal	25% removal
Stormwater mitigation	25% removal	25% removal
Permeable reactive barriers	1,500 linear feet	1,500 linear feet
Coastal habitat restoration	--	2 acres
Floating constructed wetlands	--	750 cubic feet
Ecotoilets (UD and compost)	--	17 homes
I&A systems	--	24 homes
Unattenuated load remainder	341 homes	--

The bookends are simply guides established to provide starting points for communities as they approach the development of hybrid solutions (combination of traditional and non-traditional approaches). These will be used as a reference point for the hybrid evaluations are performed for Salt Pond and Town Cove as called for in the Scope for Task Order #1.

This same Tracker model program will be used to develop hybrid alternatives (alternatives consisting of both traditional and non-traditional mitigation measures) in subsequent phases of this project for both Town Cove and Salt Pond watersheds.

6. SUMMARY OF PREVIOUS ALTERNATIVES AND PROPOSED HYBRID EVALUATION PROCESS FOR THE PROJECT FOCUS AREA

Table 4 summarizes the alternative management plans recommended in the 2009 Plan Evaluation Report.

Table 4 Summary of Recommended Alternative Management Plans

Area of Concern	Alternative Management Plan	Drinking Water Supply (1)	Roach Property WWTF (2)	Orleans WWTF (3)	I/a Systems (4)	Dredging /Aeration (5)	Pond Treatment (6)
Town-Wide (TW)	***TW Drinking Water Supply Plan***	*X*					
Nauset-Town Cove Estuary (NE)	NE Watershed Plan 1		X				
	NE Watershed Plan 2			*X*			
	NE Watershed Plan 3				X		
Rock Harbor Estuary (RH)	NE Watershed Plan 1		X				
	RH Watershed Plan 2			*X*			
	RH Watershed Plan 3					*X*	
Freshwater Pond System (FP)	FP Watershed Plan 1		X				
	FP Watershed Plan 2			X			
	FP Watershed Plan 3						*X*

Notes:

(1) Town to establish public water supply from a protected source; either from new wells within Eastham or from Orleans.

(2) Sewering properties in the watershed (area of concern) and wastewater treatment and recharge at a new community/municipal wastewater treatment facility at the proposed Roach Property WWTF in northern Eastham.

(3) Sewering properties in the watershed (area of concern) and wastewater treatment and recharge at the Orleans WWTF - proposed to be constructed at the Tri-Town Septage Treatment Facility site.

(4) Individual on-site systems approved by MassDEP for nitrogen removal.

(5) Further evaluation of possible aeration and dredging management of Rock Harbor.

(6) Periodic pond treatments with alum.

In the next phase of this project, hybrid evaluations will be developed for Salt Pond and the Eastham side of Town Cove in order to determine the feasibility and cost-effectiveness of incorporating the non-traditional mitigation measures identified in this memorandum into the recommended alternative management plans. A

hybrid evaluation will be performed for each area, and will evaluate each of these sub-watershed systems using the CCC tools and estimate cost and feasibility of the hybrid approach.

The Town has expressed interest in incorporating the following non-traditional technologies into the hybrid evaluations:

- Permeable Reactive Barrier downstream of the Town's landfill.
- Shellfish aquaculture/propagation.
- Improvements to the Salt Pond Visitor Center (Cape Cod National Seashore) onsite wastewater treatment system.
- Stormwater reductions from Route 6/MassDOT.
- Fertilizer reductions.

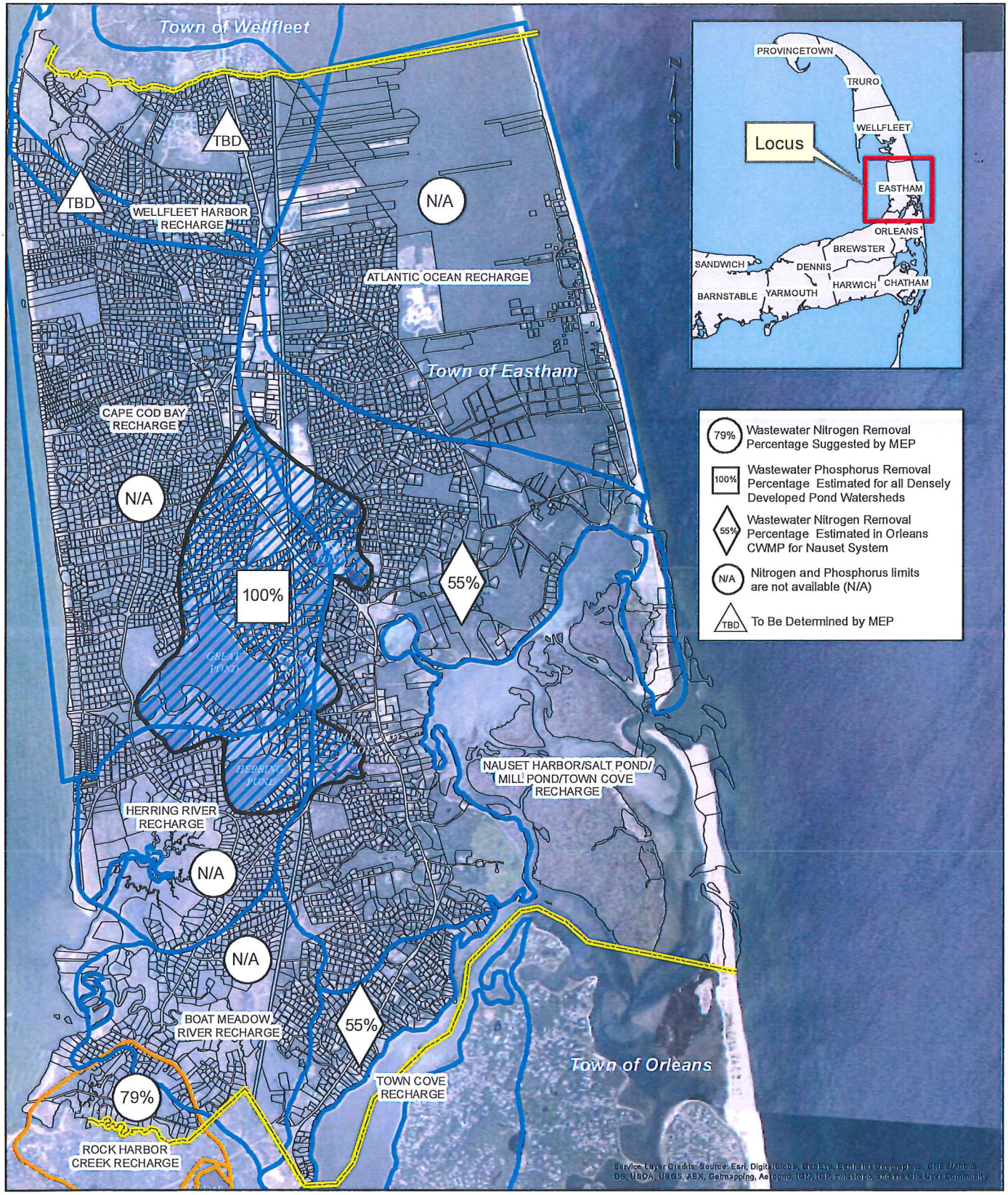
During the development of the hybrid evaluations the other non-traditional technologies identified in this memorandum will be kept in a "toolbox" and incorporated as needed if a feasible solution cannot be reached with the technologies the Town has expressed the most interest in pursuing.

The hybrid evaluations will be conducted using the following approach:

- Develop scenarios which incorporate components of the recommended alternative management plans and the non-traditional technologies the Town is interested in pursuing, through discussions with Town Staff.
- Use the CCC Tracker model and MVP tools to determine the quantity and combination of different technologies that can be used in order meet the nutrient reduction goals.
- Develop cost estimates for each scenario run under the hybrid evaluations.
- Determine potential sites for non-traditional site implementation for each scenario.

The results of the hybrid evaluations will be summarized in Technical Memoranda Nos. 3 and No. 4.

Figures



Legend

Town Line | Cape Cod Commission Watersheds | MEP Watershed | Parcel Boundary

Paper Size ANSI A

0 900 1,800 3,600 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001

Town of Eastham, Massachusetts
Technical Memorandum # 2

WATERSHED DELINEATIONS AND ESTIMATED % NUTRIENT REMOVAL

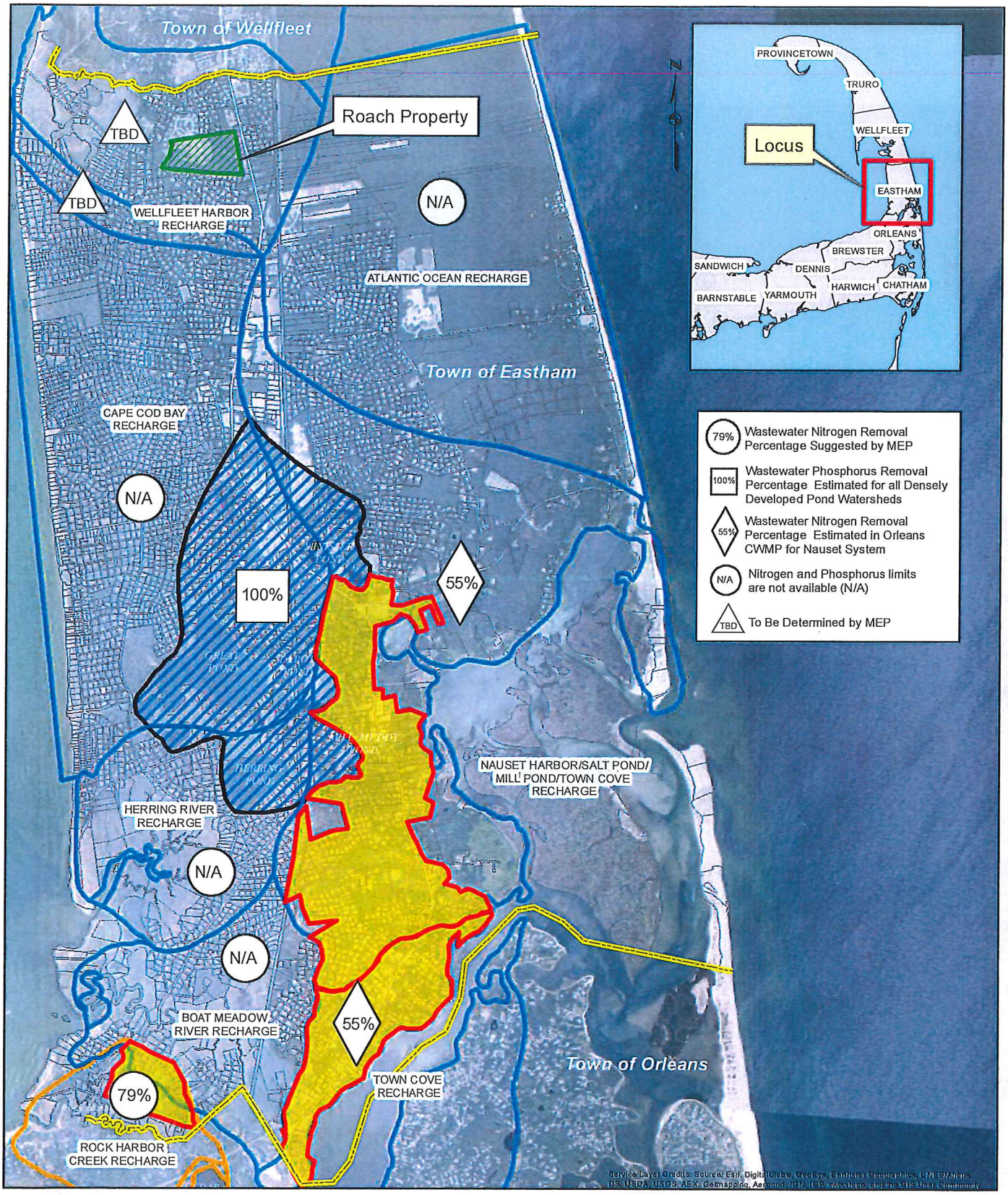
Job Number 86-18665
Revision A
Date 03 Sep 2015

Figure 1

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

N:\US\Hyannis\Projects\86\18665\GIS\Maps\MXD_Deliverables\7-14-2015 Presentation\FIGURES 9-3-2015\Tech Memo 2\86-18665F01.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:jjobrien



Legend

- Tentative Sewer Service Area (Based on Future Flow)
- MEP Watershed
- Cape Cod Commission Watersheds
- Parcel Boundary

Paper Size ANSI A

0 900 1,800 3,600 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001

Town of Eastham, Massachusetts
Technical Memorandum # 2

Job Number 86-18665
Revision A
Date 03 Sep 2015

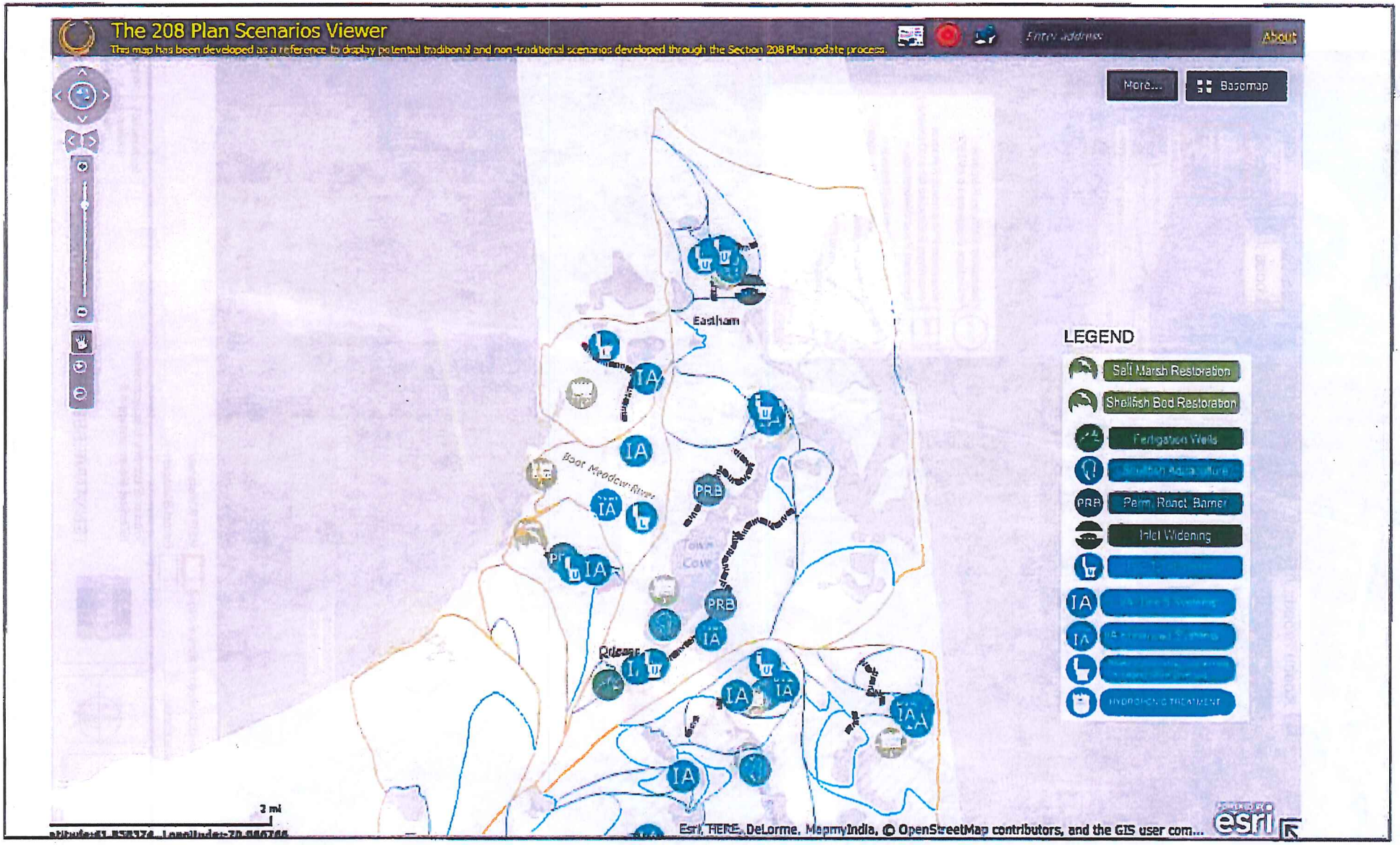
TENTATIVE SEWER SERVICE AREAS

Figure 2

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

N:\US\Hyannis\Projects\86\18665\GIS\Maps\MXD_Deliverables\7-14-2015 Presentation\FIGURES 9-3-2015\Tech Memo 2\86-18665F02.mxd

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:jjobrien



Paper Size ANSI A

N

GHD

Town of Eastham, Massachusetts
Technical Memorandum # 2

Job Number | 86-18665
Revision | A
Date | 03 Sep 2015

208 Plan Scenarios View – Nauset Harbor
Proposed Non-Traditional Technology Locations

Figure 3

N:\US\Hyannis\Projects\86\18665\GIS\Maps\MXD_Deliverables\7-14-2015 Presentation\FIGURES 9-3-2015\Tech Memo 2&6-18665F03.mxd

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

Data source: Data Custodian, Data Set Name/Title, Version/Date. Created by:jjobrien

III a-d

February 16, 2016

To: Board of Selectmen

From: Sheila Vanderhoef, Town Administrator

Re: Committee Appointments

The following is the information needed to make one committee appointment.

James Cohen
The interview committee recommends the appointment of James Cohen as a regular member to the Old Town Historic District Commission.

If the Board appoints him, his first term would commence February 16, 2016 and expire June 30, 2016.
He is to replace Mary Nicolini, whose term was to have ended June 30, 2016.

Ruth Gail Cohen
The interview committee recommends the appointment of Ruth Gail Cohen as a regular member to the Search Committee.

If the Board appoints her, her first term would commence February 16, 2016 and expire June 30, 2017.
She is to replace Barbara Stahl, whose term ended June 30, 2014.

Joanna Buffington
The interview committee recommends the appointment of Joanna Buffington as a regular member to the Open Space Committee.

If the Board appoints her, her first term would commence February 16, 2016 and expire June 30, 2017.
She is to replace Steve Gulrich, whose term ended June 30, 2014.

Carolyn McPherson
The interview committee recommends the appointment of Carolyn McPherson as a Member-at-Large to the Community Preservation Committee.

If the Board appoints her, her first term would commence February 16, 2016 and expire June 30, 2018.
She is to replace Judith Poulin, whose term ended June 30, 2015.

SEARCH COMMITTEE INTERVIEW FORM

Interview Date &Time: 1/22/2016

Committee Interviewing for: Old Town District Hist. Commission

Applicant(s):

1. James Cohen
2. _____
3. _____
4. _____

RECOMMENDATION OF THE INTERVIEW PANEL

The Interview Panel, consisting of the Committee Chair, the Selectmen Liaison and the Search Committee Liaison recommend to the Board of Selectmen that the following applicant be appointed:

James Cohen.

This recommendation is based on the following: Mr. Cohen lives in district, is an architect, a member of the Nat'l Trust for Historic among other professional associations and is eminently qualified for this commission

INTERVIEW PANEL

Jane E. Fischer
Committee Chair

Jane Fischer
Signature of Committee Chair

John Knight
Selectmen Liaison

Signature of Selectmen Liaison

Jessica Dill
Search Committee Liaison

Jessica Dill
Signature of Search Committee Liaison

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

ADMINISTRATION

Date Received: SEP 28 2015 **Date Interviewed:** _____

Disposition: RECEIVED

9/28: emailed John knight gloria sayoefer cc: jdill

EASTHAM VOLUNTEER FORM

One of the foundations of good government in a small town is volunteer citizen participation on the boards, commissions, and committees, which play a vital part in the management of local affairs. The members of these boards and committees arbitrate issues that arise in interpreting and enforcing local laws, and recommend policies that will help to shape the future of our Town.

11/6- Gloria + John looking for signed interview form.- (email)

Name: JAMES A. COHEN

Address: 135 LOCUST ROAD, EASTHAM, MA 02642

Mailing Address (if different): _____

Home Phone: (774) 801-2417 Cell Phone: (518) 526-8487

Work Phone: _____ Email: jac106@icloud.com

LOCAL COMMITEES: Please indicate up to three boards, commissions, or committees in which you are interested. Place a "1" next to your top priority, continuing with "2" and "3" as appropriate. If you have no preferences, simply check up to three.

Please note: To be appointed to a regulatory committee (bold letters), you must be a registered voter in Eastham, and you may only serve on one regulatory committee at any one time. To be appointed to a non-regulatory committee, you must be a resident or a non-resident taxpayer.

___ Animal Advisory Committee
___ Bikeways Committee
___ Board of Assessors
___ **Board of Health** (Regulatory)
___ Board of Highway Surveyors
___ Board of Cemetery Commissioners
___ Community Preservation Committee
___ **Conservation Commission** (Regulatory)
___ Council on Aging Board of Directors
___ Cultural Council
___ Finance Committee
___ Historical Commission
___ Human Services Advisory Committee
___ Long Range Planning Committee
/ Olde Town Centre Historic District
___ Open Space Committee
___ **Planning Board** (Regulatory)
___ Public Access Committee of Eastham (P.A.C.E)
___ Recreation Commission
___ Recycling Committee
___ Search Committee
___ 1651 Forest Advisory Committee
___ Visitor's Tourism and Promotion Services Board
___ Water Management Committee
___ **Zoning Board of Appeals** (Regulatory)

___ **Other**

Please fill out back of form

JAMES A. COHEN

135 LOCUST ROAD EASTHAM, MA 02642 TEL. (774) 801-2417
CELL. (518) 526-8487

RESUME

Education

Bachelor of Architecture Syracuse University, 1962
Architectural Study Trip Europe 1962
Architectural Study Trip Europe 1967

Professional Experience

Registered Architect New York State (1967), Massachusetts (1992), Vermont (2002)
Virginia (2003), Tennessee (2004)
Certified by the National Council of Architectural Registration Boards
Partnership – Mesick Cohen Wilson Baker Architects, 1995
Partnership – Mesick Cohen Waite Architects, 1989 - 1995
Partnership – Mendel Mesick Cohen Waite Hall Architects, 1984 - 1989
Partnership – Mendel Mesick Cohen Waite Architects, 1976 - 1984
Partnership – The Preservation/Design Group, 1976
Partnership – Mendel Mesick Cohen Architects, 1973 - 1976
Partnership – Blatner Mendel Mesick Cohen Architects, 1971 - 1973
Architect – Blatner Mendel Mesick Architects, 1969 - 1971
Project Architect Anthony B. Davies and Associates London, England, 1967 - 1969
Architectural Draftsman and Designer, 1963 - 1967

Professional Activities

Member – IEBC Technical Subcommittee, NYS Fire Prevention and Building Code Council
Member - Association for Preservation Technology
Member - Preservation League of New York State
Member - Construction Specifications Institute
Member - American Institute of Architects
Member - New York State Association of Architects, Inc.
Member - National Trust for Historic Preservation
Member - Society of Architectural Historians
Past Treasurer - Eastern New York Chapter of American Institute of Architects
Past VicePresident - Eastern New York Chapter of American Institute of Architects

Community Activities

Member - President, Board of Trustees, Historic Albany Foundation, Albany, NY
Member - Educationway Advisory Committee, City of Albany
Past Member - Visitors Committee, Hancock Shaker Village, Hancock, MA
Past Member of Board of Directors Citizens for the Empire State Institute for the Performing Arts
Past Member Board of Governors - Hudson River Club, Albany, NY
Past Member Board of Directors Daughters of Sarah Foundation
Past Member - Lark Street Revitalization Group, Albany, NY

Old Town Centre Historic District Commission Charge

SECTION 1. This by-law shall be known and may be cited as the Eastham Historic District By-Law and is adopted pursuant to Chapter 40C of the General Laws of the Commonwealth of Massachusetts Amended.

SECTION 2. Purpose: The purpose of this by-law is to promote the educational, cultural, economic and general welfare of the public through the preservation and protection of the distinctive characteristics of building and places significant in the history of the Town of Eastham or their architecture, and through the maintenance and improvement of settings for such buildings and places and the encouragement of design compatible therewith.

SECTION 3. Historic District: There is hereby established under the provision of Chapter 40C of the General Laws and historic districts be known as the "Old Town Centre Historic District" which district shall be bounded as shown on map entitled "Old Town Centre Historic District", 1986, attached and made part of this by-law.

SECTION 4. Historic District Commission Membership: There is hereby established under Chapter 40C of the General Laws an Historic District Commission consisting of five unpaid regular members and two unpaid alternate members appointed by the Board of Selectmen within the Town of Eastham where at least one regular member, when possible, shall be a nominee of the local historical society: at least one regular member, where possible, shall be a nominee of the Chapter of the American Institute of Architects; a third regular member, when possible, shall be a nominee of the Board of Realtors covering the . If the above groups do not submit nominees, commission members may then be chosen from the categories listed below. When the Commission is first established, one regular and one alternate member shall be appointed for two years, and two regular members shall be appointed for three years. Successors shall each be appointed for a term of three years. Vacancies shall be filled within sixty days by the Board of Selectmen by appointment for the unexpired term. In the case of absence, inability to act, or unwillingness to act because of self-interest by a member, the Chairman shall designate an alternate member of the Commission to act for a specified time. The Commission shall elect annually a Chairman and Vice-Chairman from its own number and a Secretary from within or without its number.

*Additional membership suggestions: Lawyer, professional historian, residents of district, member of Planning Board, member of Conservation Commission, individuals interested in historic preservation.

SECTION 5. Duties and Powers of the Commission: The Historic District Commission shall have all the powers and duties of Historic District Commission as provided by the Historic Districts Act, General Laws, Chapter 40C, and of subsequent amendments thereto unless specifically limited by this by-law.

A. Rules and Regulations: The Commission may adopt rules and regulations not inconsistent with the provisions of the Historic District Act.

A. The Commission may, subject to appropriation, employ clerical and technical assistants or consultants and incur other expenses appropriate to the carrying on of its work.

B. General Regulatory Powers: The Commission shall have control over new construction, reconstruction, alterations, movements and demolitions of all exterior architectural features of buildings and structures within the Historic District which are visible from any public street, public way or public park within the Historic District, except as limited by this by-law. The term "structure" includes stone walls, fences and appurtenant fixtures on lots, buildings or structures. For purposes of this by-law, and structure partially within the Historic District shall be considered wholly within the district.

C. Considerations: In passing upon matters before it, the Commission shall consider, among other things, the historic and architectural value and significance of the site, building or structure, the general design arrangement of the features involved, and the relation of such features to similar features of building and structures in the surrounding area. In the case of new construction or additions to existing buildings or structures, the Commission shall consider the appropriateness of the size and shape of the building or structure both in relation to the land area upon which the building or structure is situated and to buildings and structures in the vicinity, and the Commission may, in appropriate cases, impose dimensional and setback requirements in addition to those required by applicable zoning by-laws.

D. The Commission may determine from time to time after public hearing that certain categories of exterior architectural features, or structures may be constructed or altered without review by the Commission.

SECTION 6. Limitations and Exemptions

A. The Historic District Commission shall not make any recommendation or requirement with regard to new construction, reconstructions or additions except for the purpose of preventing developments incongruous to the historic aspects of architectural characteristics of the surroundings and of the historic district.

B. The following are exempt from the control of an Historic District Commission:

1. Ordinary maintenance and repair of any exterior architectural feature if such repair and maintenance does not involve a fundamental change in design and materials.

2. Any constructions, demolitions or alterations under a permit issued by a building inspector or similar agent prior to the effective date of the establishment of the district.

3. Any constructions, demolitions or alterations under orders issued by a building inspector or similar agent of the purpose of public safety.

4. Landscaping with plants, tress, hedges or shrubs.

5. Terraces, walks, sidewalks and other similar structures, including driveways or parking lots provided that the structure is at grade level.

6. Storm doors and windows, screen doors and windows, air conditioners and conventional roof-top TV antennae. (Not exempt from Commission review would be TV satellite dishes and short-wave radio antennae).

7. The reconstruction substantially similar in exterior design of a building, structure or exterior architectural feature damaged or destroyed by fire, storm, or other disaster provided such reconstruction is begin within one year thereafter and carried forward with due diligence.

8. A. Signs used for residential occupation or professional purposes which are not more than one foot square in area are excluded from review, provided that:

a) Only one sign is displayed for each building or structure.

b) The sign consists of letters painted on wood without a symbol or trademark.

c) If illuminated, is illuminated only indirectly.

d) All signs should conform to the present Eastham Town Sign Code except as herein noted.

C. Signs used in connection with non-residential purposes which are not more than twelve square feet in area are excluded from review, provided that:

1. Only one sign is displayed for each building or structure.

2. The sign consists of letters painted on wood without a symbol or trademark;

3. If illuminated, is illuminated only indirectly.

4. All signs should conform to present Eastham Town Sign Code except as herein noted.

a) Temporary signs and structures up to thirty days.

SECTION 7. Procedures

A. Except as this by-law provides in Section 5, no building or structure within the historic district shall be constructed or altered in any way that affects exterior architectural features unless the Commission shall first have issued a certificate off appropriateness a certificate of non-applicability or a certificate of hardship with respect to such construction or alteration. Nor shall any building permit for demolition be issued for any building or structure within the historic district until the certificate required by this section has been issued by the Commission.

B. Applications for certificates shall be made in triplicate with the Historic District Commission. Applications shall be in the form specified by the commission, to include plans and elevations drawn to scale, detailed enough to show architectural design of the structure and its relation to the existing building, and other materials deemed necessary by the Commission Plot and site plans should be filed when application for certificates are made for improvements affecting appearances, such as walls and fences. In the case of demolition or removal, the application must include a statement of the proposed condition and appearance of the property thereafter.

C.

D. Within fourteen (14) days of the filing of an application for any certificate, the Commission shall determine whether the application involves any features which are subject to approval by the Commission.

E. If the application requires the Commission's review or at the request of the application the Commission shall hold a public hearing, unless waived according to the provision of Chapter 40C of the General Laws, as amended. Public notice of the time, place and purposes of the hearing shall be given at least fourteen (14) days in advance and the Commission must notify by mail affected parties as provided in Chapter 40C of the General Laws, as amended.

F. The Commission shall decide upon the determination of any application within sixty (60) days of its filing or within such further time as the applicant may request in writing.

G. A Certificate of Appropriateness shall be issued to the applicant if the Commission determines that the proposed construction or alteration will be appropriate for or compatible with the preservation or protection of the historic district. In the case of a disapproval or an application for a Certificate or Appropriateness, the Commission shall place upon its records the reasons for such determination and shall forthwith cause a notice of its determination, accompanied by a copy of the reasons therefore as set forth in the records of the Commission to be issued to the application, and the Commission may make recommendations to the applicant with respect to appropriateness of design. Prior to the issuance of any disapproval, the Commission may notify the applicant of its proposed action, accompanied by recommendations of changes in the applicant's proposal which, if made, would make the application acceptable to the Commission. If within fourteen (14) days of the receipt of such notice, the applicant files a written modification of his application in conformity with the recommended changes of the Commission, the Commission shall issue a Certificate of Appropriateness to the applicant.

H. Upon request, the Commission may issue a Certificate of Non-Applicability to any applicant whose request does not require Commission approval.

I. If an application is deemed inappropriate or if application is made for a Certificate of Hardship, the Commission may issue a Certificate of Hardship if conditions especially affecting the building or structure involved, but no affecting the historic district generally, would make failure to approve an application involve a substantial hardship, financial or otherwise, to the applicant, and approval would not involve substantial detriment to the public welfare. A Certificate of Hardship shall also be issued in the event that the Commission does not make a determination on an application within the time specified in Section 7E of this by-law.

J. Each certificate shall be dated and signed, and the Commission shall keep a permanent record of its determinations and of the vote of each member participating therein, and shall file a copy or notice of certificates and determinations of disapproval with the Town Clerk and the Building Inspector.

K. An applicant may, within twenty (20) days of the filing of the decision of the Commission with the Town Clerk, appeal to a superior court. The Commission must pay costs only if it appears to the court that the Commission has acted with gross negligence, bad faith or malice.

L. Violation of any of the provision of this by-law shall incur a fine of not less than ten dollars ($10.00) nor more than five hundred dollars ($500.00), each day constituting a separate offense.

SECTION 8. The Town of Eastham shall be subject to the provisions of this by-law notwithstanding any Town By-Law to the contrary.

SECTION 9. This by-law may be amended from time to time by a two-thirds (2/3) vote of the Town Meeting subject to the procedures as set forth in Chapter 40C, Section 3 of the General Laws.

SECTION 10. In case any section, paragraph or part of this by-law be for any reason declared invalid or unconstitutional by any court of last resort, every other section, paragraph or part shall continue in full force and effect.

SECTION 11. Effective Date: Following Town Meeting approval, this by-law shall take effect immediately when the following conditions have been met:

(a) approval by the Attorney general of the Commonwealth;
(b) filing of a map of the boundaries of the Historic District with the Eastham Town Clerk, the Eastham Building Inspector and the Registry of Deeds for Barnstable County, *or take any action relative thereto.*

By Historic District Study Committee
Under the provisions of Chapter 40C, Massachusetts General Laws, as amended by Chapter 168, Acts of 1975 by-law was adopted at Annual Town Meeting 1986.

Old Town Centre Historic District Commission Members

Katherine Alpert 60 Chipmunk Lane Eastham, MA 02642	Term ends- 6/30/2018 508-240-0871 (h) 508-725-8730 (c) Reappointed 7/1/2015- Term 3 kyelo@comcast.net
Sherida Cocchiola- ***Alternate*** 10 Maple Drive Prospect, CT 06712	Term ends- 6/30/2018 508-255-8480 (Eastham h) 203-758-6456 (CT h) - Term 3 Reappointed 7/1/2015
Jane Fischer - CHAIR 225 Deacon Paine Road Eastham, MA 02642	Term ends - 6/30/2018 508-255-5769(h) Reappointed 7/1/2015 - Term 3 h.fischer3@verizon.net
Gail O'Keefe-Edson- CLERK 25 Split Rail Road Eastham, MA 02642	Term ends - 6/30/2018 508-255-7610 (h) Reappointed 7/1/2015 - Term 3 gokemip@gmail.com
Mark Murzyn 230 Locust Road Eastham, MA 02642	Term ends - 6/30/2017 508-247-9443 (h) 617-455-5391 (c) Appointed 7/20/15 – Term 1 Murz652@comcast.net
Karen Boucher 5 Jack-Cin Drive Eastham, MA 02642	Term ends – 6/30/2016 508-240-3109 (h) Appointed November 16, 2015 kpbcapecod@aol.com

NEED:
1 Regular Member to replace Mary Nicolini, who resigned and whose term was to end June 30, 2016.

Updated: 12/14/15

SEARCH COMMITTEE INTERVIEW FORM

Interview Date &Time: February 3, 2016

Committee Interviewing for: Search Committee

Applicant(s):

1. Ruth Gail Cohen
2. _____
3. _____
4. _____

RECOMMENDATION OF THE INTERVIEW PANEL

The Interview Panel, consisting of the Committee Chair, the Selectmen Liaison and the Search Committee Liaison recommend to the Board of Selectmen that the following applicant be appointed:

Ruth Gail Cohen.

This recommendation is based on the following: Ruth Gail is relatively new to Eastham. In her prior community, she served on several boards + committees. She is a member of Naweil Newcomers and, as such, may be able to attract other newer residents to town committees.

INTERVIEW PANEL

Jessica Dill
Committee Chair

Signature of Committee Chair

Selectmen Liaison

Signature of Selectmen Liaison

Judy Cannon
Search Committee Liaison

Signature of Search Committee Liaison

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

Date Received: _____ RECEIVED JAN 13 2015 BY: _____

EASTHAM VOLUNTEER FORM

One of the foundations of good government in a small town is volunteer citizen participation on the boards, commissions, and committees, which play a vital part in the management of local affairs. The members of these boards and committees arbitrate issues that arise in interpreting and enforcing local laws, and recommend policies that will help to shape the future of our Town.

Name: Ruth Gail Cohen

Address: 185 Cooks Brook Road, Eastham

Mailing Address (if different): _____

Home Phone: _____ Cell Phone: 610-506-6681

Work Phone: _____ Email: rgjc31@gmail.com

LOCAL COMMITEES: Please indicate up to three boards, commissions, or committees in which you are interested. **Place a "1" next to your top priority, continuing with "2" and "3" as appropriate.** If you have no preferences, simply check up to three.

Please note: To be appointed to a regulatory committee (bold letters), you must be a registered voter in Eastham, and you may only serve on one regulatory committee at any one time. To be appointed to a non-regulatory committee, you must be a resident or a non-resident taxpayer.

___ 1651 Forest Advisory Committee
___ Board of Assessors
___ **Board of Health (Regulatory)**
___ Board of Cemetery Commissioners
___ Community Preservation Committee
___ **Conservation Commission (Regulatory)**
___ Council on Aging Board of Directors
___ Cultural Council
___ Finance Committee
___ Historical Commission
___ Human Services Advisory Committee
___ Old Town Centre Historic District
___ Open Space Committee
___ **Planning Board (Regulatory)**
___ Recreation Commission
___ Recycling Committee
X Search Committee
___ Visitor's Tourism and Promotion Services Board
___ Water Management Committee
___ **Zoning Board of Appeals (Regulatory)**

Please fill out back of form

Describe briefly your experience, including volunteer service, that you feel would be useful to the Town and to the committee(s) you are interested in. You may add any additional information including education, other formal training, specialized courses, professional licenses or certifications.

☐ Check here if additional information is attached.

I have served on many boards and committees in neighborhood, religious and professional organizations while living in Pennsylvania.

Some but not all of these were: Professional development, superintendent advisory council, clergy search committee and neighborhood councils.

If you have served or are serving on a committee in the Town, please list the committee(s) and the year(s) and term(s) served:

Committee Name:	Term Served:
_____	_____
_____	_____
_____	_____

Check the Town website (www.eastham-ma.gov) for meeting dates and times and additional committee information. If you have any questions, call Town Hall, 508-240-5900.

Please respond to the following additional questions:

I have:

• **Attended a meeting(s) of the committee(s) selected.**	Yes (No)
• **Read the charge of the committee**	(Yes) No
• **Met with the chair(s) of the committee(s)**	(Yes) No
• **Read The Ten Rules Municipal Employees Need to Know about the Conflict of Interest Law**	(Yes) No
• **If applying to a regulatory committee, are you a registered voter in Eastham?**	(Yes) No

If you are aware of any possible conflicts of interest to serve on a particular committee, please contact the MA State Ethics Commission @ (617) 371-9500 or (888) 485-4766 for an opinion.

Signature: Ruth Gillcoken Date: 1/13/16

Completed form will be kept on file for two years.

Please return completed form to:

Selectmen's Office
Eastham Town Hall
2500 State Highway
Eastham, MA 02642
Phone: 508-240-590 Fax: 508-240-1291

Charge To The Search Committee

A Search Committee of seven (7) members shall be appointed for three-year overlapping terms.* No member shall serve more than nine consecutive years. Three (3) members shall be appointed by the Board of Selectmen, two (2) members shall be appointed by the Town Moderator and two (2) members shall be appointed by the Finance Committee.

The committee shall advise the Board of Selectmen, the Finance Committee and the Town Moderator concerning the names and qualifications of taxpayers' of the town available to serve on multi-member bodies. Additionally, the Search Committee shall periodically review all committee charges and make recommendations to the Board of selectmen to consolidate, eliminate, add and/or recharge committees.

The Search Committee may establish procedures for soliciting candidates for consideration including, but not limited to, direct contact, newspaper or other media advertisements, and personal knowledge and recommendations. Further, the Search Committee members may consult with current and former committee members or chairs to assist in determining preferred skills for individuals to be considered. Only town residents or taxpayers are eligible for consideration for appointment to town committees. In certain cases, employees may be appointed to a committee as an advisory member unless prohibited by law. All potential candidates shall be informed of their responsibilities under the Open Meeting Law and Ethics Law, and told of the requirement to take the ethics exam available on line, prior to being sworn into a position, and that additional information on the Open Meeting law is available from the Town Clerk and the Attorney General, and additional information on Ethics is available from the Town Clerk and the Secretary of State Office.

The Chair of the Search Committee, upon receipt of a committee vacancy, shall convene a meeting of the Search Committee to begin the process of filling the vacancy. The process is as follows:

1. Review appropriate applications in the committee applications book at Town Hall.
2. Contact subject committee chair to review applicant pool and confirm next meeting date and time.
3. Contact the applicant(s) to determine whether they are still interested in being on the committee(noted on their form, and whether they have attended subject committee meetings before. (If not, inform the applicant(s) of the next scheduled committee(s) meeting date(s) and times.) All applicants are *required* to attend a committee meeting prior to appointment to the committee. If the committee does not have a meeting scheduled, then, the Search Committee shall contact th Chair of the subject committee and encourage h/she to meet with the applicant prior to the interview.
4. Interviews of all applicants will be conducted by an interview panel consisting of one member from th Search Committee, one member of the Board of Selectmen (This may be the liaison to the Searc Committee, the liaison to the subject committee, or a Selectman designated by the Chair of the Boa of Selectman) and the Chair or his/her designee, from the multi member committee/board/commissic needing a new member. (These interviews are subject to the open meeting law posting requirement These meetings are public meetings but not public hearings, and while the public is invited to atten they are not allowed to participate, or question the candidate in said interview/meetings.)
5. The interview panel shall select preferred candidate(s) for appointment by the Board of Selectmen ar forward a written recommendation stating the reasons therefore. No candidate shall be recommende without a positive vote of the Committee Chair and Selectman representative on the interview panel.
6. On the next available Monday night meeting, the Board of Selectmen, having reviewed the applicatic and recommendation of the search committee, shall meet the candidate. The candidate will b encouraged to give a 1 or 2 minute overview of their background, qualifications, or service history.
7. The Board of Selectmen shall appoint the recommended candidate, on Monday or at the followir Wednesday meeting.

Committee created by the Eastham Home Rule Charter-1992, and as amended May 2010.
Approved by Board of Selectmen on October 4, 2010

*Pending adoption of a special act by the State Legislature, submitted June 2010, to change the Town Charter.

Search Committee Members

Jessica Dill - CHAIR 35 Sands Road Eastham, MA 02642	Term ends - 6/30/2017 508-255-7771 (h) Reappointed 7/1/2014- Term 2 Jrdill1@comcast.net ***Moderator Appointment***
Dilys Jones Smith P.O. Box 1800 805 Cable Road North Eastham, MA 02651	Term ends- 6/30/2018 508-255-9647 (h) Reappointed 6/30/2015- Term 2 dsmith@capecod.net ***Moderator Appointment***
Judith Cannon 3620 State Highway Eastham MA 02642	Term ends 6/30/2017 508-255-4000 (h) judy@towncriermotel.com ***Finance Committee Appointment***
Gloria Schropfer 110 Treat Road P.O. Box 1924 North Eastham, MA 02651	Term ends- 6/30/2016 508-255-2825 (h) 508-280-3633 (c) Reappointed 7/1/2013- Term 2 gschropfer@enviroderm.com ***Board of Selectmen Appointment***

NEED:

1 Member to replace Steven Cole. Finance Committee Appointment - Term ended 2013.
1 Member to replace Barbara Stahl, BOS Appointment – Term ended 2014
1 Member to replace Bob Smith, BOS Appointment – Resigned, term to end 2016

Updated: 1/13/16

SEARCH COMMITTEE INTERVIEW FORM

Interview Date &Time: February 4, 2016

Committee Interviewing for: Open Space Committee

Applicant(s):

1. Joanna Buffington
2. _____
3. _____
4. _____

RECOMMENDATION OF THE INTERVIEW PANEL

The Interview Panel, consisting of the Committee Chair, the Selectmen Liaison and the Search Committee Liaison recommend to the Board of Selectmen that the following applicant be appointed:

Joanna Buffington.

This recommendation is based on the following: Joanna has served on the Board of Health and Bd of Assessors. She is well respected for her depth of knowledge on the relevant issues and commitment. She has attended an Open Space Comm. mtg and had valuable input.

INTERVIEW PANEL

Committee Chair	Signature of Committee Chair: Robert C Gurney
Selectmen Liaison	Signature of Selectmen Liaison
Search Committee Liaison: Jessica Dill	Signature of Search Committee Liaison: Jessica Dill

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

RECEIVED
FEB 01 2016
BY:

EASTHAM VOLUNTEER APPLICATION

Date Received: Jan 30, 2016
Date Interviewed:

Application Number: VA-35
Disposition: Active

One of the foundations of good government in a small town is volunteer citizen participation on the boards, commissions, and committees, which play a vital part in the management of local affairs. The members of these boards and committees arbitrate issues that arise in interpreting and enforcing local laws, and recommend policies that will help to shape the future of our Town.

Name	**Joanna Buffington**			
Street Address	1395	SAMOSET RD		
Mailing Address		EASTHAM	MA	02642

Home Phone	678-592-5438	Work Phone	
Cell Phone	678-592-5438	Email	jobuffington@gmail.com

LOCAL COMMITEES: Please indicate up to three boards, commissions, or committees in which you are interested. **Please note:** To be appointed to a regulatory committee **(bold letters), you must be a registered voter in Eastham,** and you may only serve on one regulatory committee.

1 Open Space
2
3

Describe briefly your experience, including volunteer service, that you feel would be useful to the Town and to the committee(s) you are interested in. You may add any additional information including education, other formal training, specialized courses, professional licenses or certifications Describe briefly your experience, including volunteer service, that you feel would be useful to the Town and to the committee(s) you are interested in. You may add any additional information including education, other formal training, specialized courses, professional licenses or certifications.

Experience:

On Boards of Health and Assessors currently. Serve as Clerk for the Eastham Conservation Foundation, so overlapping interests with Open Space committee. Have attended one session, and discussed with Peter Wade (a current member).

no

If you have served or are serving on a committee in the Town, please list the committee(s) and the year(s) and term(s) served:

Committee Served	Terms Served
Board of Health	in second term
Board of Assessors	in second term

Check the Town website http://www.eastham-ma.gov/Public_Documents/EasthamMA_BComm/index for meeting dates and times and additional committee information. If you have any questions, call Town Hall, 508-240-5900.

Please respond to the following additional questions. I have:

Attended a meeting(s) of the committee(s) selected.

Read the charge of the committee.

Met with the chair(s) of the committee(s).

Read The Ten Rules Municipal Employees Need to Know about the Conflict of Interest Law.

Comments:

This Volunteer Form is being filed with the Town's Search Committee to be processed. The Committee will contact you for an interview.

If you are aware of any possible conflicts of interest to serve on a particular committee, please contact the MA State Ethics Commission @ (617) 371-9500 or (888) 485-4766 for an opinion.

I certify that the above information is accurate and true.

Joanna Buffington
Electronic Signature

Jan 30, 2016
Date

Completed form will be kept on file for two years at:

Town of Eastham Town Hall- Selectmen Office
2500 State Highway Eastham, MA 02642
Phone: 508-240-590 Fax: 508-240-1291

Charge To The Open Space Committee

In accordance with the Town of Eastham Home Rule Charter Section 9-5-13, the Board of Selectmen hereby establishes an Open Space Committee. Said committee shall be composed of ***seven members***, appointed by the Board of Selectmen for three year overlapping terms. *One member shall also be a member of the Conservation Commission*, and may serve as chair, if so selected.

The specific responsibilities of the committee shall be to:

1. Prepare and maintain an open space planning document for the Town of Eastham in accordance with 301 CMR 7.04 & 7.01;

2. To identify and prioritize a program of continuous land acquisition and protection;

3. To develop plans for use and maintenance of current open space holdings;

4. To develop plans for use and maintenance of potential open space acquisitions, and to include such plans in comments to the Board of Selectmen concerning recommended acquisitions under the C.P.A. as part of an acquisition report

Revised and adopted by the Board of Selectmen on July 18, 2005.

Open Space Committee Members

Karen G. Baker P. O. Box 1240 North Eastham MA 02651	Term ends – 6/30/2016 508-255-5211 (h) Appointed 2/18/2014
Robert Gurney - CHAIR 30 Horatio Road P.O. Box 1176 North Eastham, MA 02651	Term ends 6/30/2016 508-240-1155 (h) 508-221-1673 (c) Appointed 7/1/13- Term 1 bgcapecod@verizon.net
Peter Wade 625 Bridge Road Eastham, MA 02642	Term ends- 6/30/2018 508-237-1399 (h) Reappointed 7/1/2015- Term 3 phwade@comcast.net
Michael Harnett P.O. Box 573 North Eastham, MA 02651	Term end – 6/30/2018 508-247-9691 (h) 973-738-4987 (c) Appointed 8/3/2015 MRH2681@gmail.com **Conservation Commission Rep.**

Need:
1 member to replace Steve Gulrich. Term ended 6/30/14.
1 member to replacer Robert Jacovino, who resigned effective 2/18/15. Term was to expire 6/30/15.
1 member to replace Robert Cook. Term ended 6/30/15.

Updated: 8/4/2015

SEARCH COMMITTEE INTERVIEW FORM

Interview Date &Time: 2/11/2016 8:30 am + 9:00 a.m

Committee Interviewing for: Community Preservation

Applicant(s):

1. Carolyn McPherson
2. Gena Cerasale
3. _____
4. _____

RECOMMENDATION OF THE INTERVIEW PANEL

The Interview Panel, consisting of the Committee Chair, the Selectmen Liaison and the Search Committee Liaison recommend to the Board of Selectmen that the following applicant be appointed:

Carolyn McPherson.

This recommendation is based on the following: Ms. McPherson brings a wealth of experience in the areas of affordable housing + human services. She has served on citywide committees that review + make recommendations on funding. She has read the links on the CPC page of the Town website and has shown a deep interest in its charge.

INTERVIEW PANEL

Peter Wade	Peter Wade
Committee Chair	Signature of Committee Chair
Elizabeth Gawron	Elizabeth Gawron
Selectmen Liaison	Signature of Selectmen Liaison
Jessica Dill	Jessica Dill
Search Committee Liaison	Signature of Search Committee Liaison

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

EASTHAM VOLUNTEER APPLICATION

Date Received: Jan 22, 2016
Date Interviewed:

Application Number: VA-33
Disposition: Active

One of the foundations of good government in a small town is volunteer citizen participation on the boards, commissions, and committees, which play a vital part in the management of local affairs. The members of these boards and committees arbitrate issues that arise in interpreting and enforcing local laws, and recommend policies that will help to shape the future of our Town.

Name	**Carolyn McPherson**			
Street Address	8	FALLON RD		
Mailing Address		Eastham	MA	02642

Home Phone	757-377-1850	Work Phone	757-377-1850
Cell Phone	757-377-1850	Email	cmcpherson8@cox.net

LOCAL COMMITEES: Please indicate up to three boards, commissions, or committees in which you are interested. **Please note:** To be appointed to a regulatory committee **(bold letters), you must be a registered voter in Eastham,** and you may only serve on one regulatory committee.

1 **Community Preservation Committee**
2
3

Describe briefly your experience, including volunteer service, that you feel would be useful to the Town and to the committee(s) you are interested in. You may add any additional information including education, other formal training, specialized courses, professional licenses or certifications Describe briefly your experience, including volunteer service, that you feel would be useful to the Town and to the committee(s) you are interested in. You may add any additional information including education, other formal training, specialized courses, professional licenses or certifications.

Experience:

I have worked in the area of affordable housing and human services for over 13 years. I have served on city wide committees that review and make recommendations on HUD funding.

Extra info is being sent in.

If you have served or are serving on a committee in the Town, please list the committee(s) and the year(s) and term(s) served:

Committee Served	Terms Served

Check the Town website http://www.eastham-ma.gov/Public_Documents/EasthamMA_BComm/index for meeting dates and times and additional committee information. If you have any questions, call Town Hall, 508-240-5900.

Please respond to the following additional questions. I have:

Attended a meeting(s) of the committee(s) selected.	**no**
Read the charge of the committee.	**yes**
Met with the chair(s) of the committee(s).	**no**
Read The Ten Rules Municipal Employees Need to Know about the Conflict of Interest Law.	**yes**

Comments:

I have met with Eileen Morgan who is a committee member and she encouraged me to apply.

This Volunteer Form is being filed with the Town's Search Committee to be processed. The Committee will contact you for an interview.

If you are aware of any possible conflicts of interest to serve on a particular committee, please contact the MA State Ethics Commission @ (617) 371-9500 or (888) 485-4766 for an opinion.

I certify that the above information is accurate and true.

carolyn mcpherson
Electronic Signature

Jan 22, 2016
Date

Completed form will be kept on file for two years at:

Town of Eastham Town Hall- Selectmen Office
2500 State Highway Eastham, MA 02642
Phone: 508-240-590 Fax: 508-240-1291

Community Preservation Committee Members

James Baughman 300 Samoset Road Eastham, MA 02642	Term ends 6/30/2016 508-255-8849 (h) 856-220-7986 Appointed 2/18/2015 – Term 1 (replaced L. Haspel) jkawbau@gmail.com **Conservation Commission Representative**
Edward Brookshire P.O. Box 745 Eastham, MA 02642	Term ends – 6/30/2016 508-255-4061 (h) Joyfulcreations43@comcast.net Appointed November 6, 2013 Term 2 **Eastham Housing Authority Rep.**
Josiah Holden Camp, Jr.,~Vice~Chair 10 Drake Circle P.O. Box 791 Eastham, MA 02642	Term ends- 6/30/2018 508-240-2409 (h) camp@hartford.edu Reappointed 7/1/2015- Term 2 **Historical Commission Rep.**
Edmund Casarella 15 Seaside Drive P. O. Box 1714 North Eastham MA 02651	Term ends-6/30/2017 508-255-0573 fcasarella@verizon.net Reappointed 2014-Term 2 **Recreation Commission Rep**
Daniel Coppelman 235 Eldredge Drive P.O. Box 384 North Eastham, MA 02651	Term ends - 6/30/2016 508-255-7539(h) Appointed 12/1/14 – Term 1 coppelman@aol.com **Planning Board Rep.**
L. Michael Hager 115 Shady Lane Eastham MA 02642	Term ends-6/30/2017 774-207-0674 (h) 202-842-1466 (cell) Appointed 11-3-2014 – Term 1 l_michaelhager@hotmail.com **Member-At-Large**
Eileen Morgan 560 Campground Road P. O. Box 781 North Eastham MA 02651	Term ends-6/30/2017 508-255-9585 (h) 978-835-9791(c) Appointed 11/18/13-Term 1 baygetaway@comcast.net **Aff. Hous. Trust (Task Force) Com. Rep.**
Peter Wade~CHAIR 625 Bridge Road Eastham, MA 02642	Term ends- 6/30/2018 508-237-1399 (h) phwade@comcast.net Reappointed 7/1/2015- Term 3 **Open Space Representative**

Need 1 member to replace Judith Poulin, whose term ended (as Clerk) 6/30/15 as Member-at-Large

Updated 5/28/15

Community Preservation Committee By-Law

1.0 Membership of the Committee. There is hereby established a Community Preservation Committee, consisting of nine (9) voting members pursuant to the provisions of G.L., c.44B, §5., appointed by the Board of Selectmen. The composition of the committee and the term of office for the committee members shall be as follows: one member of the Conservation Commission as designated by said Commission; one member of the Historical Commission as designated by said Commission; one member of the Planning Board as designated by said Board; one member of the Recreation Commission, as designated by said Commission; one member of the Eastham Housing Authority as designated by said Authority; one member of the Eastham Affordable Housing Task Force as designated by said Task Force; one member of the Open Space Committee as designated by said Committee; and two at large individuals. Each member of the Committee shall serve for a term of three years or until the person no longer serves in the position or on the board or committee as set forth above, whichever is earlier. Should any of the officers and commissions, boards, or committees who have recommending authority under this by-law be no longer in existence for whatever reason, the Board of Selectmen shall appoint a suitable person to serve in their place.

2.0 Duties. The Community Preservation Committee shall study the needs, possibilities and resources of the town regarding community preservation. The committee shall consult with existing municipal boards, including the conservation commission, the historical commission, the planning board, the department of public works, and the housing authority, or persons acting in those capacities or performing like duties, in conducting such studies. As part of its study, the committee shall hold one annual public informational hearing, or more at its discretion, on the needs, possibilities and resources of the town regarding community preservation possibilities and resources, notice of which shall be posted publicly and published for each of two weeks preceding a hearing in a newspaper of general circulation in the town.

The Community Preservation Committee shall make recommendations to the Board of Selectmen and Town Meeting for the acquisition, creation and preservation of open space, for the acquisition and preservation of historic resources, for the acquisition, creation and preservation of land for recreational use, for the creation, preservation and support of affordable housing and for rehabilitation or restoration of such open space, historic resources, land for recreational use and affordable housing that is acquired or created as provided in this section. With respect to affordable housing, the Community Preservation Committee may recommend the reuse of existing buildings or construction of new buildings on previously developed sites.

The Community Preservation Committee may include in its recommendation to the Board of Selectmen and Town Meeting, a recommendation to set aside for later spending, funds for specific purposes that are consistent with community preservation but for which sufficient revenues are not then available in the Community Preservation Fund to accomplish that specific purpose or to set aside for later spending funds for general purposes that are consistent with community preservation.

In every fiscal year, the Community Preservation Committee must recommend either that the legislative body spend, or set aside for later spending, not less than 10% of the annual revenues in the Community Preservation Fund in each of the following areas: (a) open space (not including land for recreational use), (b) historic resources, (c) affordable housing, or as otherwise authorized under Section 298 of Chapter 149 of the Acts of 2004.

3.0 Requirement for a quorum and cost estimates. The Community Preservation Committee shall comply with the provision of the Open Meeting Law, G.L. c.39, §23B. The committee shall not meet or conduct business without the presence of a majority of the members of the Community Preservation Committee. The Community Preservation Committee shall approve its actions by majority vote. Recommendations to the Board of Selectmen and Town Meeting shall include the committee's anticipated costs.

4.0 Amendments. This by-law may be amended from time to time by a majority vote of the Town Meeting, consistent with the provisions of G.L. c.44B.

5.0 Severability. In case any section, paragraph or part of this by-law is for any reason declared invalid or unconstitutional by any court, every other section, paragraph or part shall continue in full force and effect.

6.0 When Effective. Provided that Town Meeting approves Article 2 of the December 13, 2004 Special Town Meeting to adopt Section 298 of Chapter 149 of the Acts of 2004, and voters of the Town at the May 17, 2005 Annual Town Election approve adoption of same, this by-law shall take effect upon approval by the Attorney General of the Commonwealth and after all requirements of MGL.c.40, section 32 have been met. Each appointing authority shall have thirty (30) days after the effective date to make its appointments. **By-Law Adopted by Special Town Meeting on December 13, 2004.**

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

III A 2

February 16, 2016

To: Board of Selectmen

From: Sheila Vanderhoef, Town Administrator

RE: Ragnar Relay-May 13-14, 2016~ Route through Eastham

Please note that the proposed/requested route of the Ragnar Relay through Eastham has been reviewed by Deputy Police Chief Ken Roderick. He has reviewed, with the Race Director, the route to be taken and spoke on the possibility of assigning police officers to assist with traffic where and when they might be needed.

Thank you.

EASTHAM POLICE DEPARTMENT

2550 State Highway • Eastham, MA 02642
508-255-0551 • Fax: 508-255-5412

EDWARD V. KULHAWIK
Chief of Police

KENNETH J. RODERICK
Deputy Chief

February 10, 2016

To: Sheila Vanderhoef
Town Administrator

From: Edward V. Kulhawik
Chief of Police

CC: Kenneth J. Roderick
Deputy Chief

Re: Ragner Relay 2016

I am in receipt of the email from Ragner Relay for their event scheduled for May 13 and 14, 2016. Deputy Chief Kenneth Roderick is assigned to oversee this event, and has corresponded by email with the race director in regards to this year's event. They have reviewed the route to be taken, and spoken about the possibility of assigning police officers to assist with traffic where and when they may be needed.

Please feel free to contact me or Deputy Chief Roderick if you have any questions or concerns regarding this yearly event.

RAGNAR
RELAY SERIES

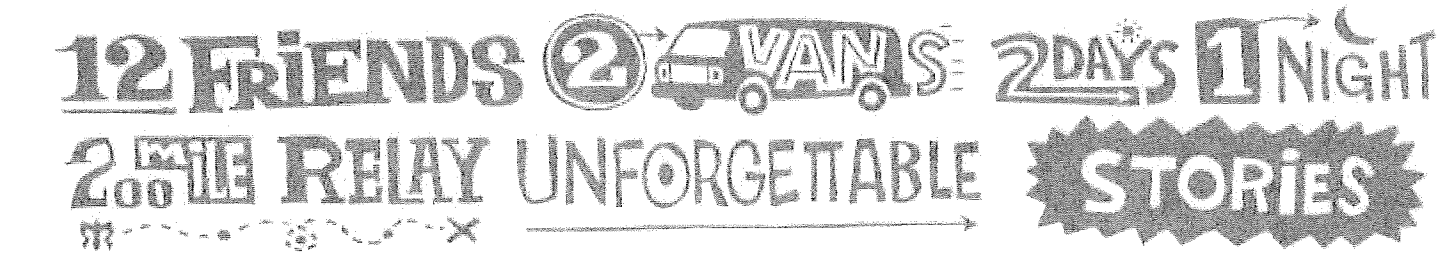
RAGNAR CAPE COD

May 13-14, 2016

THE HOLE IN THE WALL GANG CAMP

a seriousfun camp

Ragnar Cape Cod 2016 | Supplemental Information



ABOUT RAGNAR

Ragnar is the overnight running relay race that makes testing your limits a team sport.

At Ragnar, we strive to make life more awesome. This may sound like a lofty goal, but it starts very simple. We believe in better health, lasting relationships and an enormous amount of fun.

Americans average 7 hours + of screen time and 4 minutes outdoors a day. We exist to break that cycle and rebuild individuals' connections with their mind and body, with nature, and with other like-minded people. Ragnar is changing relationships, communities, participant health and wellness, and the world of endurance sports.

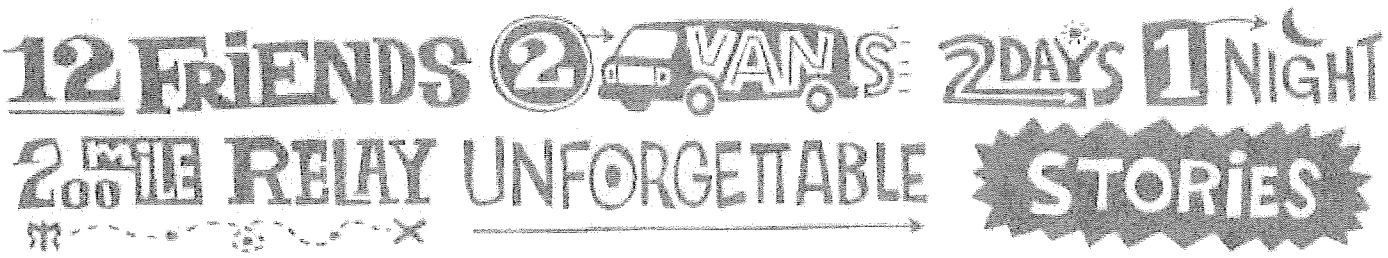
Ragnar Events presented its first event, the Ragnar Relay Wasatch Back, in Utah in 2004 and since then has grown to a national series consisting of both road and trail events that number over 38 annually. For more information, see www.ragnarrelay.com.

RAGNAR CAPE COD 2016

The race will start at Nantasket Beach in Hull, MA on Friday May 13th, 2016 and will finish at The Pilgrim Monument in Provincetown. on Saturday May 14th, 2016. The course will be nearly 200 miles consisting of 36 relay legs with each leg ranging in 3-8 miles.

Each team is responsible for providing two support vehicles, with six runners in each vehicle. The first vehicle will drop off the first runner at the start, and then proceed to the first exchange point. At the first exchange, the vehicle will drop off the second runner and pick up the first runner when that runner's leg is complete. Teams will repeat this pattern for six legs until they hand off to their second vehicle. This leapfrogging pattern will continue all the way to the finish line.

We anticipate 525 teams to participate in the race. Each team is typically comprised of 12 individuals and 2 vehicles (there are a few "ultra" teams that only have six (6) individuals and one van). Therefore, we anticipate 6100 participants and 1000 vehicles to be involved in the race.



RUNNER EXPERIENCE

In the Ragnar Relay Series, 12 crazy friends (or 5 crazier friends for an ultra team) pile into two vans and tag team running 200(ish) miles relay-style over two days and one night. Only one runner hits the road at a time. Often called a slumber party without sleep, pillows or deodorant, this unique relay turns out crazy costumes, inside jokes, close quarters and unforgettable stories. Each Ragnar brings thousands of people together to create deeper connections and celebrate together as they conquer a challenge they couldn't accomplish alone.

Participants have been unfailingly enthusiastic about their experiences. There are always a wide variety of human interest stories associated with these events. These range from the experienced runner finding special meaning through participation in a running event as a member of a team; to the first-time runner who participates at the urging of a friend and discovers previously unknown abilities and a love for running; to families, businesses, old friends and other groups who enhance their relationships as they individually and collectively test their limits; to teams who simply run for a cause, whether in honor of a deceased friend or relative, or to raise money for local charities or another charity of special importance to the team.

COMMUNITY IMPACT

Communities also directly benefit economically from money spent by participants for food, lodging and other services. Additionally, Ragnar partners with regionally based charities for each event to encompass an even more positive impact on the local communities.

This year Ragnar Events is very fortunate to partner with The Hole in the Wall Gang Camp, a non-profit organization dedicated to providing "a different kind of healing" to seriously ill children and their families throughout the Northeast, free of charge. It's a community that celebrates the fun, friendship and spirit of childhood, where every kid can "raise a little hell." Ray Shedd, Senior Development Officer of Hole in the Wall Gang Camp, said "the Ragnar experience embodies what Camp is all about – camaraderie, challenge, and a healthy dose of crazy, good fun!

Through our partnership, The Hole in the Wall Gang Camp will be receiving a monetary donation in addition to fundraising efforts on behalf of our teams.

To learn more about The Hole in the Wall Gang Camp visit: http://www.holeinthewallgang.org/

Proposal to the Town of Eastham

We propose the following route for 2016. This route was developed working with Deputy Chief Roderick.

Turn by Turn Directions

- Heading West on Rock Harbor Road
- Turn Right on Bridge Road
- Bear Right to stay on Bridge Road
- Right onto Samoset Road.
- Left onto Cape Cod Rail Trail (Vans proceed to Rt 6).
- Exit Rail Trail at Old Orchard Road.
- Arrive at **Exchange 29** – Arnolds Lobster & Clam Bar.
- Depart Exchange 29 continuing on the Cape Cod Rail Trail
- Exit the trail and turn Right onto Brackett Rd. running against traffic
- Turn Right onto Nauset Rd.
- Turn Left onto Doane Rd.
- Turn Left onto Ocean View Drive.
- Turn left onto Cable Rd.
- Turn Right to arrive at **Exchange 30** – Nauset Regional High School

Traffic | Safety | Emergencies | First Aid

Traffic Impact

We anticipate 525 teams to register for this year's event. That means no more than 525 runners will be on the course at any given time. Teams will be provided with staggered start times, from 5 AM to 4 PM on Friday, May 13th. Because start times are spread over a 9-hour period and only 525 runners are on the course at any given time, *there will never be a large group of runners at any one location*. Typically the complete group of 525 individual runners will be spread out over 30-40 miles.

Safety

Runner safety is of foremost concern. All teams are provided a Race Bible that includes a detailed course description and event rules. All runners sign waivers to acknowledge that the course includes areas where there may be traffic congestion and that they must obey race rules, which require observance of all applicable traffic rules and regulations.

All runners are required to run on the sidewalk when available. If there is no sidewalk available then the route has been designed where a sufficient shoulder or bike lane is available. Whenever, possible our runners are directed to run against traffic as that is typical safe practice for runners. Runners are all also required to obey all crosswalk signals. Vehicles with teammates are required to obey all speed limits, traffic signs, and laws of the road.

Each team must have at least six reflective vests and two flashlights. These must be presented at the time that the team checks in. Runners starting their legs after **7:00 PM and before 6:00 AM** must be wearing a reflective vest, a flashing tail light and holding a flashlight or headlamp. Additionally, any team-member or spectator must wear a reflective vest during these hours when outside of their vehicle while on our course and on public roads.

Runners are also instructed during a required team safety briefing to text Ragnar for any concerns of problems out on the course. The designated number to reach Ragnar Race Command is 661-RAGNAR1 (661-724-6271). Race Command communicates with all Staff members via telephone, push-to-talk radio, and text. Race Command manages weather, runner location, lost runners, animal control, night time hours, and rule infractions. Teams may text if they have a lost or injured runner, a moved sign, or general question about the course. In case of emergency all runners and staff will call 911 then contact our Race Command number to let race staff know of the emergency. This number and information on our safety requirements are outlined as well on the RagMag – our race day publication.

We have 10-12 Ragnar Staff and trained volunteers on the course at all times monitoring the course. Ragnar teams can be issued by any Ragnar Staff or trained volunteer for violating any rules outlined in the RagMag. These violations are then reported to Race Command and Race Command will then notify the team that they have been given a violation.

First Aid

A first-aid station and first-aid staff will be located at each major exchange location. These first-aid stations will be equipped to handle extreme dehydration, heat stroke, and all of the minor sport injuries we often experience, including; blisters, sprains, strains, stings, etc. We require our first aid staff to be licensed to administer intravenous fluids (typically EMT intermediate and above, or RN, PA, M.D., etc). We hire first aid workers (EMT intermediate or above), either through a medical staffing agency.

In the event of a major medical emergency (i.e. any life threatening condition or injury that requires immediate medical attention) we instruct runners/volunteers to first call 911. The line of communication then follows: 911 → Race Director → Senior Race Director → Course Manager for that section.

In addition to our own first aid services on the course, we list the local emergency rooms near the course, along with their address and phone number in the race packets.

Safety | Emergencies | First Aid (2)

Contingency/inclement weather plan

Bad Weather

The race will occur rain or shine. However, under certain severe weather conditions where significant damage or altercations to the race course occur, we will cancel the event. Conditions that may result in a race being canceled or delayed include but are not limited to the following: severe electrical storm, snowfall, tornadoes, earthquakes, hurricanes, flooding, fog, etc.

Lightning

If there is lightning at the start of the race we will delay starts until the lightning clears. If runners see lightning on the course after the race has started, runners are to off the road and into the support vehicle. If lightning clears within 1 hour runner will go back on the road where they left and make a note of the time. If lightning persists longer than an hour, runners will move ahead to the next exchange and be informed of Ragnar decision on whether or not the race will continue.

Rain

If there is severe rain on the course, we will ask that runners and teams return to their support vehicles and drive to the nearest exchange point. Severe rain hold hours will be set in full hour increments. Runners will skip 1 leg per 1 hour of the hold. Teams will be directed to drive to the nearest exchange where Ragnar will send staff to manage exchange while keeping 4-8 staff members to troubleshoot on the course.

Heat

If the apparent temperature reaches 120°F we will implement a heat hold. The Heat Hold hours will be set in full hour increments. Runners will skip 1 leg per 1 hour of Heat Hold. Teams will be directed to drive to the nearest exchange where Ragnar will send staff to manage and explain the heat hold while keeping 4-8 staff members to troubleshoot on the course.

Flooding

If a runner encounters flooded areas that cannot be ran through, runner are to get into the support vehicle, drive the runner ahead where the road is no longer flooded to continue running his or her leg.

Signs

Along the course there will be course signs that communicate to the runners which direction to go, on what side of the road to run, which exchange they are at, etc. Directional signs are only placed at change of direction intersections. An example of such a sign can be seen in the picture below:

The signs are 42" High, 18" Wide, .25" Thick and are made of corrugated plastic. Each sign will be secured to a delineator post traffic cone. An example of the traffic cone is shown below.

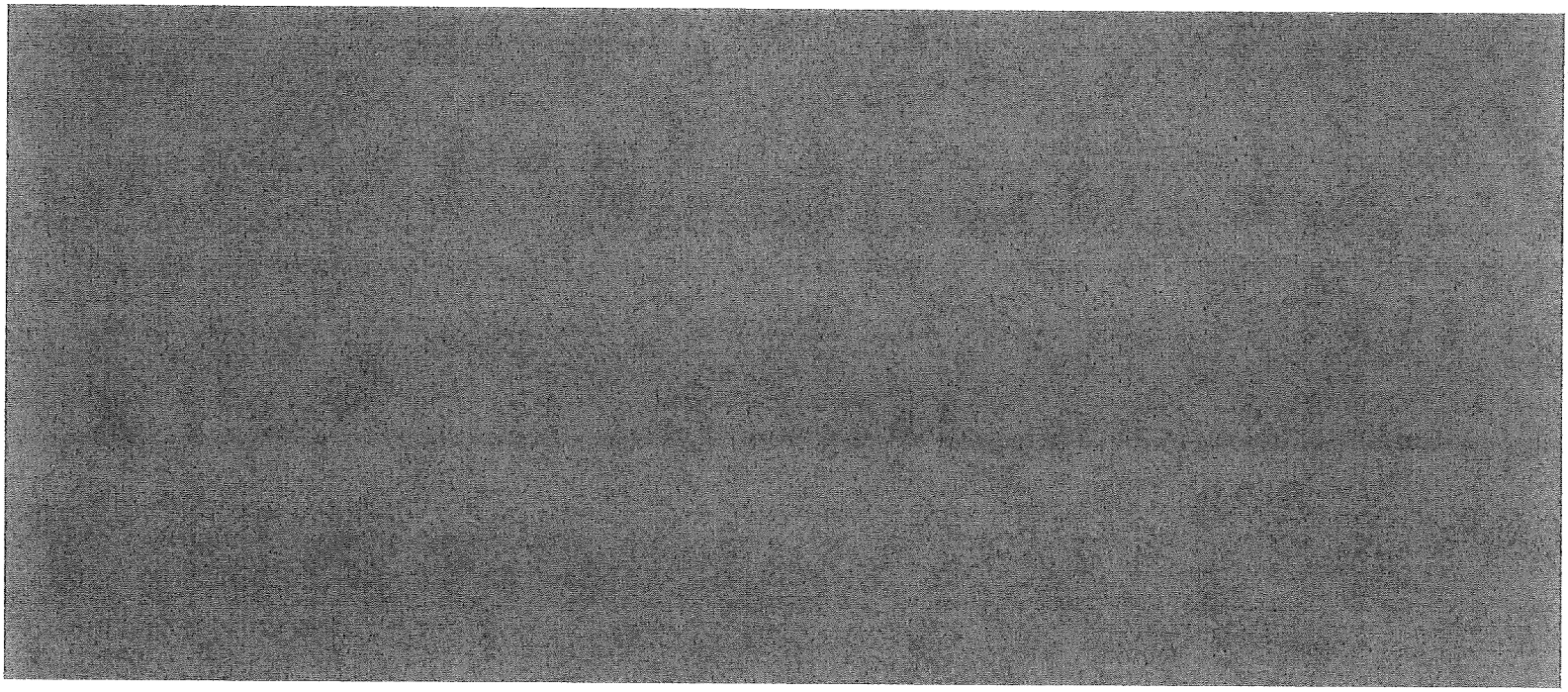
Additional Information

Insurance
We are sanctioned under USA Track and Field through American Specialty Insurance. I will forward you the certificate of insurance as soon as it is issued to us.

Waste receptacles
We will hire a company to place dumpsters at each of our major exchange locations. In addition – the exchange will also have various Ragnar trash boxes for participants on site at the Finish line. Volunteers and Staff will be given the task of emptying the trash cans and keeping exchanges clean.

Toilets

We will hire a company to place toilets at each of our exchange locations. A minimum of 20 toilets will be placed at Nantasket Beach.



RAGNAR Cape Cod presented by new balance

THE HOLE IN THE WALL GANG CAMP

a seriousfun camp

Mike Dionne | Race Director
Ragnar Relay Series

7 Donna Pass, Hopkinton MA 01748
Corporate Office:
12 S. 400 W. | 2nd Floor
Salt Lake City, UT 84101
O 877.83.RELAY ext. 142
F 801.499.5023
C 617-686-3216
mdionne@ragnarrelay.com
www.ragnarrelay.com

III A 3.

EASTHAM POLICE DEPARTMENT

2550 State Highway • Eastham, MA 02642
508-255-0551 • Fax: 508-255-5412

EDWARD V. KULHAWIK
Chief of Police

KENNETH J. RODERICK
Deputy Chief

January 26, 2016

TO: Sheila Vanderhoef
Town Administrator

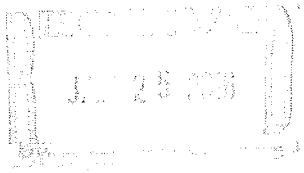
FROM: Edward V. Kulhawik
Chief of Police

RE: MS Challenge Walk

I am in receipt of the information regarding the National MS Challenge Walk on September 9th to 11th, 2016. I have no issues regarding this event, and will be sure to have officers ready to work the details this event requires.

Please feel free to contact me should you have any questions or concerns regarding this event.

National
Multiple Sclerosis
Society
Greater
New England
Chapter



Ms. Sheila Vanderhoef
Town Administrator
2500 State Highway
Eastham, MA. 02642

January 21, 2016

Dear Ms. Vanderhoef,

Thank you for your support of the National Multiple Sclerosis Society and our 2015 MS Challenge Walk this past September. The event was a great success and we were able to raise $1.1 million that will go towards the continuing fight to end MS. Having our walkers in Eastham during that weekend is a large part of the success of the event.

We are holding our 15th annual Challenge Walk from September 9th – 11th, 2016. The weekend route will be the same as this past year's, and we would appreciate receiving he appropriate permits/permission from the Board of Selectman.

We will hire Eastham police officers to work safety details where needed. We operate a support team consisting of medical personnel, SAG vehicles, and amateur (HAM) radio operators. Our lead HAM radio operator monitors all emergency radio frequencies, so that we can close or redirect our route should that become necessary.

If you need any further information or have any questions, comments, or suggestions, please feel free to contact me.

Thank you for your continued support of the Greater New England Chapter MS Challenge Walk.

Best Regards,

Drew Davis
Director of Logistics
National Multiple Sclerosis Society
Greater New England Chapter
781-693-5158
Drew.davis@nmss.org

2016 MS Challenge Walk Day 2

Saturday September 10, 2016

Mileage	Next Stop	Direction	Street / Route	Instructions	W or A	Police Detail Total	Police Detail Location	Town
0.00		Exit	Exit Left onto Rt 6A	Proceed to shoulder on right	W	1	7:30am-11:30am	Brewster
0.38	0.37	R	Right into Cobies Lot	Proceed to access CCRT	Trail			
0.44	0.31	L	Left onto CCRT	Proceed on rail trail	Trail			
0.75	**3.12**	**Enter**	**Enter Rest Stop 1**	**Nickerson State Park 2nd lot**				Brewster
0.76	3.11	Exit	Exit to continue on CCRT	Continue	Trail			
0.95	2.92	X	Cross Mitchell Lane	Access Road	Trail			
1.56	2.31	X	Seaview Road	Access Road	Trail			
2.20	1.67	Exit	Exit CCRT at Salty Ridge Road		W			
2.29	1.58	L	Continue L on Salty Ridge Road		W			
2.38	1.49	SR	Sharp R onto West Road	Cross West Road to shoulder	A	1	7:30am-11:30am	Orleans
2.48	1.39	Cross	Crossover Rt 6	Sidewalk on bridge	A			
2.57	1.30	L	Enter L onto CCRT	Continue on trail	Trail			
3.11	0.76	X	Cross Main Street Orleans Center	Access Road	Trail	1	7:30am-11:30am	Orleans
3.56	0.31	X	Cross Locust Road	Access Road	Trail			
3.64	0.23	X	Cross Jones Road	Access Road	Trail			
3.80	0.07	Cross	Crossover Rt 6	Continue on trail	Trail			
3.87	**2.71**	**Enter**	**Enter Rest Stop 2**	**Orleans District Court**				Orleans
3.88	2.70	Exit	Exit L continue on CCRT		Trail			
5.05	1.53	X	Cross Gov Prence Road	Access Road	Trail			
5.50	1.08	Exit	Exit L onto Bridge Road	Proceed to shoulder on left	A			
6.11	0.47	SR	Sharp R cross Herring Brook Rd	Proceed to shoulder on left	A			
6.58	**0.91**	**XR**	**Cross enter Rest Stop 3**	**Herring Pond Beach**				Eastham
6.59	0.90	Exit	Exit R onto Herring Brook Rd	Continue on shoulder on right	W			
6.66	0.83	R	Right onto Lawton Road	Continue on shoulder on left	A			
6.98	0.51	XR	Cross R onto Samoset Road	Proceed to shoulder on left	A	1	8:30am-3:30pm	
7.49	**2.41**	**Enter**	**Enter Rest Stop 4**	**CCRT at Samoset**				Eastham
7.50	2.40	L	Enter L onto CCRT	Continue on trail	Trail			
7.95	1.95	Exit	Exit R onto Locust Road	Proceed to shoulder on left	A			
8.26	1.64	L	Left onto Salt Pond Road	Proceed to shoulder on left	A			
8.38	1.52	X	Cross Rt 6 at crosswalk	Proceed to sidewalk on right	W	1	At VC traffic light: 9am-3pm	Eastham
8.45	1.45	Pass	Salt Pond Visitor Center	Sidewalk becomes CCRT	W			
9.71	0.19	X	Cross Access Road	Access Road	Trail			
9.75	0.15	L	Left onto access road	Proceed to end on access road				
9.90	**0.96**	**Enter**	**Enter Rest Stop 5**	**Doane Picnic Area**				Eastham
9.91	0.95	Exit	Exit to L onto posted short trail	Walking trail				
10.08	0.78	L	Left onto CCRT	Proceed to Coast Guard Beach	Trail			
10.30	0.56	Cross	Crossover Footbridge	Continue on trail	Trail			
10.48	0.38	Enter	Enter Coast Guard Beach	Loop at Headquarters	Trail			
10.49	0.37	Enter	Enter onto CCRT	Proceed back to Doane Picnic Area	Trail			
10.86	**0.12**	**Pass**	**Footpath to Rest Stop 6**	**Doane Picnic Area**	**Trail**			Eastham
10.98	**2.30**	**Pass**	**Access road from Rest Stop 6**	**Doane Picnic Area**	**Trail**			
11.08	2.20	X	Cross Access Road	Access Road	Trail			

12.31	**0.97**	**Pass**	**Salt Pond Visitor Center (lunch)**	**Sidewalk to Crosswalk**	**A**			
12.44	0.84	X	Cross Rt 6 onto Salt Pond Road	Proceed to shoulder on left	A			
12.51	0.77	R	Right onto Locust Road	Proceed to shoulder on left	A			
12.84	0.44	L	Left onto CCRT	Proceed on rail trail	Trail			
13.28	**3.00**	**Enter**	**Enter Rest Stop 7**	**CCRT at Samoset**	**ICE CREAM**			
13.74	2.54	X	Cross Bridge Road	Access Road	Trail			Orleans
14.20	2.08	X	Cross Gov Prence Road	Access Road	Trail			
16.22	**0.78**	**Enter**	**Enter Rest Stop 8**	**Orleans District Court**				Orleans
16.28	0.72	Exit	Exit R onto CCRT	Continue on CCRT	Trail			
16.33	0.67	Cross	Crossover Rt 6		Trail			
16.42	0.58	X	Cross Jones Road	Continue on CCRT	Trail			
16.47	0.53	X	Cross Locust Road	Access Road	Trail			
16.96	0.04	X	Cross Main Street Orleans Center	Access Road	Trail			
17.00	**2.37**	**Enter**	**Enter Rest Stop 9**	**Depot Square Orleans Center**				Orleans
17.01	2.36	Straight	Continue on CCRT	Continue on trail	Trail			
17.50	1.87	XR	Cross R onto West Road	Cross West Road to shoulder	A			
17.60	1.77	Cross	Crossover Rt 6	Continue on shoulder on left	A			
17.70	1.67	L	Left onto Salty Ridge Road	Proceed to CCRT	W			
17.80	1.57	R	R and enter CCRT	Continue on trail	Trail			
18.58	0.79	X	Cross Seaview Road	Access Road	Trail			
19.18	0.19	X	Cross Mitchell Lane	Access Road	Trail			
19.37	**0.83**	**Enter**	**Enter Rest Stop 10**	**Nickerson State Park Picnic Area**				Brewster
19.38	0.82	L	Exit L onto CCRT	Continue on CCRT	Trail			
19.67	0.53	Pass	Pass entrance to Cobies	Continue on CCRT	Trail			
20.00	0.20	R	Right onto Millstone Road	Proceed to shoulder on left	A			
20.10	0.10	L	Left onto Rt 6A	Proceed to shoulder on right	W			
20.20		**Enter**	**Enter R Cape Cod Sea Camp**	**End of Day 2**		1	12 - 4pm	Brewster

Grantor: Town of Eastham, Conservation Commission
Grantees: Massachusetts Audubon Society, Inc., and Eastham Conservation Foundation, Inc.
Property Address: 225 Widgeon Lane and 5 Blue Bill Lane, Eastham, MA
For Title See: Deed: Barnstable County Registry of Deeds: Bk. _, Pg. ___ Plan:
Barnstable County Registry of Deeds: Plan Bk. 338, Plan 52

GRANT OF CONSERVATION RESTRICTION TO MASSACHUSETTS AUDUBON SOCIETY AND EASTHAM CONSERVATION FOUNDATION

TERRAPIN COVE, EASTHAM, MASSACHUSETTS

The Town of Eastham, with an address of 2500 State Highway, Eastham, Massachusetts, 02642, being the sole owner of the granted premises and intending hereby to bind itself and its successors and assigns, acting by and through its Conservation Commission, pursuant to Massachusetts General Laws Chapter 40, Section 8C (hereinafter referred to collectively as the "Grantor"), , for consideration of One Dollar ($1.00) paid, hereby grants, with Quitclaim Covenants, to Massachusetts Audubon Society, Inc., a Massachusetts Non-Profit Corporation having its usual place of business at 208 South Great Road, Lincoln, Massachusetts, 01773 ("Mass Audubon"), and Eastham Conservation Foundation, Inc., a Massachusetts Non-Profit Corporation, P.O. Box 183, Eastham, Massachusetts 02642, their successors and permitted assigns (hereinafter collectively referred to as the "Grantees"), in perpetuity and exclusively for conservation purposes, the following described Conservation Restriction on 1.6 +/- acres of land located in the Town of Eastham, Barnstable County, Massachusetts, known as "Terrapin Cove" (the "Premises"), being shown as Lots 35 and 36 on a plan entitled " 'Duck Meadow' Subdivision Plan of Land in Eastham", dated October 1979 and recorded with the Barnstable Registry of Deeds in Plan Book 338, Plan 52, a copy of which is included herewith as Exhibit A.

The Grantor is authorized to grant this Conservation Restriction pursuant to vote of the Town of Eastham Annual Town Meeting held on May 4, 2015, acting on Article 23 of the Warrant, a certified copy of which is attached hereto as Exhibit B. For Grantor's title see Barnstable Registry of Deeds Book _____ Page ____.

I. Purposes

This Conservation Restriction is defined in and authorized by Massachusetts General Laws, Chapter 184, and Sections 31-33 and otherwise by law. The purpose of the Conservation Restriction is to assure that the Premises will be retained in perpetuity predominantly in their natural, scenic and undeveloped condition and for the preservation of its historic landscape, and

to prevent any use of the Premises that would significantly impair or interfere with the conservation and historic values of the Premises.

The public benefits resulting from conservation and preservation of the Premises includes, without limitation:

A. Protection of Wildlife Habitats. The Premises lie within an area that has been mapped as BioMap Core Habitat and Estimated Habitat of Rare Wetland Wildlife by the Massachusetts Natural Heritage and Endangered Species Program (NHESP). Protection of the Premises will help protect and support rare species located on and surrounding the Premises, including but not limited to the Diamondback Terrapin, a state and federally listed species (threatened status), and the habitat and nesting areas that they need to survive.

B. Protection of Water Resources. Permanent conservation of the Premises will avert the construction and operation of on-site septic disposal systems, additional impervious driveways and other areas, and the introduction of fertilizers and other household chemicals commonly associated with residential development. This will reduce direct and indirect impacts to the adjacent marsh, protecting water quality and function of natural systems.

C. Protection of Scenic Resources. The Premises comprise part of a highly scenic Bee's River Marsh landscape, Coastal Conservation District, and Heritage Landscape Inventory. Protection of the Premises will preserve the scenic character and scenic views of this open and aesthetically important landscape in the Town of Eastham.

D. Protection of Recreational Resources. Conservation of the Premises will preserve the public's use and enjoyment of the Premises for passive recreation, including the potential for passive trail-based activities, provided that these activities will not compromise the wildlife habitat values described above.

E. Furtherance of Government Policy, Eastham. Protection of the Premises is consistent with the Town of Eastham's most recently completed Open Space and Recreation Plan.

F. Furtherance of Government Policy, Massachusetts. Protection of the Premises is in furtherance of the policy of the Commonwealth of Massachusetts' mandate to protect conservation land under Article 97 of the Massachusetts Constitution, consistent with the Community Preservation Act requirements and funding appropriated by Town Meeting vote for the land purchase.

This Conservation Restriction will provide permanent protection of the conservation and historic values of the Premises. The conservation values of the Premises and the public benefits of this Conservation Restriction are described in more detail in a Baseline Documentation Report to be kept on file at the offices of the Grantor and Grantees and incorporated herein by this reference. Mass Audubon shall have primary responsibility for the preparation of the Baseline

Documentation Report. Responsibilities of the Grantees for stewardship of this Conservation Restriction are provided for in a separate Memorandum of Agreement.

II. Binding Effect, Prohibited Acts and Uses, Reserved Rights, and Permitted Uses

A. Binding Effect

The Grantor covenants that the Premises will at all times be held, used, and conveyed subject to and not used in violation of the following restrictions that shall run with the Premises in perpetuity.

B. Prohibited Acts and Uses

Subject to the reserved rights set forth in Paragraph C below, the Grantor will neither perform nor allow others to perform the following acts and uses which are prohibited in, on, under, and over the Premises:

1. Constructing or placing or allowing to remain any temporary or permanent building, structure, facility, or improvement including but not limited to tennis court, landing strip or pad, greenhouse, mobile home, swimming pool, skating rink, fences, asphalt concrete or other forms of impervious pavement, billboard or other advertising display, antenna or dish, utility pole, tower, conduit, line, storage tanks, water supply lines, pumps, or other temporary or permanent structure or facility or improvement on, above or under the Premises;

2. Mining, excavating, dredging, cutting, destroying, or removing from the Premises or bodies of water thereon, of soil, loam, peat, gravel, sand, rock or other mineral resource or natural deposit or otherwise make topographical changes to the area;

3. Installing underground storage tanks;

4. Placing, filling, storing or dumping on the Premises of soil, refuse, trash, yard wastes such as lawn clippings, leaves, branches (other than those naturally occurring in the area), vehicle bodies or parts, rubbish, debris, junk, waste or other substance or material whatsoever;

5. Cutting, removing or otherwise destroying trees, shrubs, grasses or other vegetation;

6. Subdivision or conveyance of a part or portion of the Premises alone, or division or subdivision of the Premises, and no portion of the Premises may be used towards building or development requirements on this or any other parcel;

7. Conducting activities detrimental to drainage, flood control, water conservation, water quality, erosion control, soil conservation, archaeological conservation, plants, or wildlife habitat;

8. Using the Premises for residential, commercial, or industrial purposes or non-conservation municipal purposes.

9. Except for vehicles necessary for emergencies or handicapped accessibility,, the use, parking or storage of motorized vehicles including motorcycles, mopeds, all-terrain vehicles, trucks, tractors, mowers, motorized farm equipment, tillers, recreational vehicles, trail bikes or snowmobiles;

10. The disruption, removal or destruction of the stone walls or granite posts on the Premises;

11. Using herbicides and pesticides, or using other chemical or mechanical means that may have an adverse impact upon the plant life or wildlife within the restricted area;

12. Hunting and trapping except as may be permitted by the Grantee under special circumstances for ecosystem protection and wildlife management purposes and approved by Grantor;

13. Conducting any other use of the Premises or activity which, in the reasonable opinion of the Grantee, is or may become inconsistent with the intent and purpose of this Conservation Restriction, that is the preservation and protection of the Premises in their natural and scenic condition, or which would materially impair its conservation and historic values, unless necessary in an emergency for the protection of the conservation and historical values that are the subject of this Restriction.

C. Reserved Rights

Notwithstanding any of the Prohibited Acts and Uses in subparagraph B above, the following acts and uses are permitted on the Premises, but only if such acts or uses do not materially impair the purposes or the conservation values of this Conservation Restriction or other significant conservation interests and where applicable if such acts and uses have been expressly permitted by the Grantee in writing as set forth below:

1. Forestry and Vegetation Removal. In accordance with best management practices, (a) selective pruning and cutting of trees and other vegetation to control or remove hazards, invasive species, or damage caused by disease, insects or fire, or to preserve the present condition of the Premises, including woods roads and trails; and (b) following notice to the Grantees, the cutting of trees for any non-commercial purpose in accordance with a plan, prepared by an appropriate natural resources professional, in consultation with the Natural Heritage & Endangered Species Program, and approved by the Grantees, that is designed to protect the conservation values of the Premises, including without limitation, wildlife habitat, water quality and scenic values.

2. Signs. The erection, maintenance and replacement of signs by the Grantor with respect to ownership, boundaries, regulations governing public use, trails, natural features, flora and fauna, and the protected conservation values.

3. Minor Educational and Recreational Structures. The construction, maintenance, repair and replacement of minor structures for use by the public for educational and passive recreational purposes, including but not limited to interpretive signs, exhibits and benches. Said structures shall be designed and located so as not to have a material deleterious impact on the conservation purposes (including scenic values) of this Conservation Restriction.

4. Recreational and Educational Activities. Subject to Paragraph IV. D., walking, hiking, nature study and other similar non-motorized outdoor passive recreational and educational activities that do not materially alter the landscape, degrade environmental quality, involve commercial recreational use or compromise the conservation and wildlife habitat values described herein. In accordance with Paragraph IV. B. and IV. C., nature study and educational activities by Grantor's and Grantees' instructors and their invitees which do not involve commercial use. Parking for passive recreational and educational activities permitted herein may be allowed only within public rights of way.

5. Composting. The stockpiling and composting of stumps, tree and brush limbs and similar biodegradable materials originating on the Premises in locations where the presence of such materials will not have a deleterious impact on the purposes (including nesting habitat or scenic values) of this Conservation Restriction..

6. Trails and stone walls. The construction, maintenance and marking of trails (including bridges and boardwalks) for pedestrian use. The erecting of gates to control unauthorized access to the Premises.

7. Wildlife Habitat Management and Improvement. In consultation with the Natural Heritage & Endangered Species Program, and with prior written notice to and approval by Grantees, measures designed to restore native biotic communities, or to maintain, enhance or restore wildlife, wildlife habitat, or rare or endangered species.

8. Archaeological Investigations. The conduct of archaeological activities, including without limitation survey, excavation and artifact retrieval, following submission of an archaeological field investigation plan and its approval in writing by the State Archaeologist of the Massachusetts Historical Commission (or appropriate successor official).

9. Permitted Acts and Uses. All acts and uses not prohibited by subparagraphs B and C, and not otherwise permitted herein, are permissible so long as they do not materially impair the conservation and historic values of this Conservation Restriction and are not expressly prohibited by any management plan which may

be in effect for the Premises, provided written approval is obtained from the Grantees.

The Grantor shall notify and obtain the approval of the Grantees, to the extent required above, in writing before the date the Grantor intends to undertake any of the activities described in Paragraphs II.C.1 (b), II.C.3, II.C.6, II.C.7, and II.C.8 of this section or whenever notice to or approval by the Grantees is required herein and not less than 35 days prior to the date when the Grantor intends to undertake the proposed activity. The notice shall describe the nature, scope, design, location, timetable, and any other material aspect of the proposed activity in sufficient detail to permit the Grantees to make an informed judgment as to the activity's consistency with the purposes of this Conservation Restriction. The Grantees shall grant or withhold the Grantees' approval in writing within thirty (30) days of receipt of the Grantor's written request therefore. Grantees' approval shall not be unreasonably withheld, but shall only be granted upon a showing that the proposed activity shall not materially impair the purposes of this Conservation Restriction and the conservation values of the Premises. Failure of the Grantees to respond in writing within 30 days shall be deemed to constitute approval by the Grantees of the request as submitted, so long as the request sets forth the provisions of this section relating to deemed approval after 30 days in the notice, the requested activity is not prohibited herein, and the activity will not materially impair the purposes or conservation values of the Premises.

The exercise of any right reserved or permitted by the Grantor under this paragraph C shall be in compliance with the then-current Zoning Bylaw of the Town of Eastham, the Wetlands Protection Act (General Laws Chapter 131, Section 40), and all other applicable federal, state and local laws and regulations. The inclusion of any reserved or permitted right requiring a permit from a public agency does not imply that the Grantees take any position on whether such permit should be issued.

D. Affirmative Obligation

The Premises shall be managed for habitat protection purposes pursuant to a Management Agreement to be developed by the Grantor and Grantees, which may be revised periodically by the parties.

III. Legal Remedies of the Grantees

A. Legal and Injunctive Relief

The rights hereby granted shall include the right to enforce this Conservation Restriction by appropriate legal proceedings and to obtain injunctive and other equitable relief against any violations, including, without limitation, relief requiring restoration of the Premises to its condition prior to the occurrence of the violation (it being agreed that the Grantee will have no adequate remedy at law). The rights hereby granted shall be in addition to, and not in limitation of, any other rights and remedies available to the Grantee for the enforcement of this Conservation Restriction. Notwithstanding the foregoing, prior to exercising the rights hereunder, the Grantees shall first notify the Grantor in writing of any alleged violations and the Grantor shall have ten (10) business days to rectify same ("Cure Period"). Failing the restoration

or cessation of the alleged violation within the Cure Period, then the Grantees shall be entitled to seek legal and injunctive relief as noted herein.

Grantees agree to cooperate with Grantor for a reasonable period of time of up to ten (10) additional business days after the expiration of the first ten (10) business days referenced above, which time may be extended by Grantees in their sole discretion, prior to resorting to legal means in resolving issues concerning violations provided Grantor ceases objectionable actions, provides Grantees with a plan to remedy the violations, and Grantees determine there is no ongoing diminution of the conservation and historic preservation values of the Conservation Restriction.

Grantor covenants and agrees to reimburse to Grantees all reasonable costs and expenses (including reasonable counsel fees) incurred in enforcing this Conservation Restriction or in taking reasonable measures to remedy, abate or correct any violation thereof, provided that a violation of this Conservation Restriction is acknowledged by Grantor or determined by a court of competent jurisdiction to have occurred.

In the event of a dispute over the boundaries of this Restriction, the non-prevailing party shall be responsible for the costs of a survey and placement of permanent boundary markers delineating the bounds of the Premises...

Nothing herein shall preclude the Grantor's and Grantees' right to pursue other parties for damage to the Premises caused by vandalism, trespass, or other violations of this Restriction.

B. Grantees' Disclaimer of Liability

By the Grantees' acceptance of this Conservation Restriction, the Grantees do not undertake any liability or obligation relating to the condition of the Premises not caused by Grantees or their agents.

C. Non-Waiver

Enforcement of the terms of this Conservation Restriction shall be at the discretion of the Grantees. Any election by the Grantees as to the manner and timing of the Grantees' right to enforce this Conservation Restriction or otherwise exercise the Grantees' rights hereunder shall not be deemed or construed to be a waiver of such rights.

D. Acts Beyond Grantor's Control

Nothing contained in the Conservation Restriction shall be construed to entitle Grantees to bring any actions against Grantor for any injury to or change in the Premises resulting from causes beyond Grantor's control, including, but not limited to, fire, flood, storm and earth movement, or from any prudent action taken by Grantor under emergency conditions to prevent, abate or mitigate significant injury to the Premises resulting from such causes. As soon as possible thereafter, the Grantor shall notify the Grantees of any action which has been taken.

Grantor and Grantees agree that in the event of such an occurrence they will cooperate in restoring the Premises, if desirable and feasible.

IV. Access

The Conservation Restriction hereby conveyed does not grant to Grantees, to the public generally, or to any other person any right to enter upon the Premises except as follows:

A. Monitoring and Enforcement. Grantor hereby grants to Grantees and its representatives the right to enter the Premises (a) after reasonable notification to the Grantor, at reasonable times and in a reasonable manner for the purpose of inspecting the same to determine compliance herewith; (b) following consultation with Grantor, to erect and from time to time replace near the boundaries of the Premises a reasonable number of signs each no greater than four square feet identifying Grantees as the holder of this Conservation Restriction; and (c) after 30 days' prior written notice (or shorter time when, in Grantees' sole judgment, an imminent threat to the Premises' conservation values requires a more immediate response), to take any and all actions with respect to the Premises as may be necessary or appropriate, with or without order of court, to remedy, abate or otherwise enforce any violation hereof. Reasonable time shall be between the hours of 9:00 a.m. and dusk.

B. Nature Study. Grantor hereby grants to Grantees and their representatives the right to enter the Premises to study, identify and monitor the site's flora and fauna, hydrology and other environmental conditions.

C. Environmental Education. Grantor hereby grants to Grantees the right up to ten (10) times each year to conduct free or fee-based environmental education programs for the public on the Premises, provided, however, that a staff member, instructor, volunteer, or member of the Board of Directors of the Massachusetts Audubon Society or Eastham Conservation Foundation shall accompany each group and that Grantor's permission shall be obtained for additional programs or if the group exceeds 20 persons, and under every circumstance the Grantee shall provide 15 days prior notice and any proof of insurance as necessary.

D. Public Access. Grantor further grants to Grantees and to the general public the right to enter and/or leave the Premises, to pass and repass on the Premises for purposes of walking and other passive outdoor recreational activities all as set forth in Paragraph II.C, including access by motorized wheelchairs or other disabled assistance devices, not involving the use of motorized vehicles and subject to any rules and regulations promulgated by the Grantor regarding public access.

However, and notwithstanding the foregoing, in the event of an emergency or should the Grantor undertake to perform maintenance or other activities which could pose harm or the possibility of harm to the Public, if public access will affect wildlife species during nesting season, then the Grantor shall have the right at any time, and from time to time, to temporarily bar access during time periods when emergency or such activities are being conducted and

except in the case of an emergency, advance notice is provided to the Grantees and access is barred only for the time and to the minimum area necessary to prevent the possibility of harm to the Public or affect the nesting season. The provisions of Massachusetts General Laws Chapter 21, Section 17C, as same may be from time to time amended, shall be applicable to any use of the Premises by the public.

V. Assignability

A. Running of the Burden

The burdens of this Conservation Restriction shall run with the Premises in perpetuity, and shall be enforceable against the Grantor and the successors and assigns of the Grantor while holding any interest in the Premises.

B. Execution of Instruments

The Grantees are authorized to record or file any notices or instruments appropriate to assuring the perpetual enforceability of this Conservation Restriction; the Grantor on behalf of the Grantor and the Grantor's successors and assigns appoints Grantees as the Grantor's attorney-in-fact to execute, acknowledge and deliver any such instruments on the Grantor's behalf. Without limiting the foregoing, the Grantor and the Grantor's successors and assigns agree to execute any such instruments upon request.

C. Running of the Benefit

The benefits of this Conservation Restriction shall run to the Grantees, shall be in gross, and shall not be assignable by either Grantee, except in the following instances:

1. as a condition of any assignment, said Grantee shall require that the purpose of this Conservation Restriction continues to be carried out; and

2. the entity to whom the Grantee intends to assign the Conservation Restriction, at the time of assignment, shall qualify under Section 170(h) of the Internal Revenue Code of 1986, as amended or any successor statute, and applicable regulations thereunder, and under Massachusetts General Laws Chapter 184, Section 32,, as amended or any successor statute, as an eligible donee to receive this Conservation Restriction directly; and

3. any assignment shall be in compliance with the provisions required by Article XCVII (97) of the Amendments to the Constitution of the Commonwealth of Massachusetts, if applicable.

VI. Extinguishment

A. Grantees' Receipt of Property Right. Grantor and Grantees agree that the conveyance of this Conservation Restriction gives rise for purposes of this paragraph to a real property right,

immediately vested in Grantees, with a fair market value at any given time that is equal to 28% of the fair market value of the Premises as if unencumbered by this Conservation Restriction (which ratio represents the portion of Grantor's purchase price that is being contributed by Grantees) Said ratio shall remain constant.

B. Court Proceedings and Right of Grantees to Recover Portion of Proceeds at Disposition. If circumstances arise in the future that render the purpose of this Conservation Restriction impossible to accomplish, this Conservation Restriction can be terminated or extinguished, whether in whole or in part, only by judicial proceedings in a court of competent jurisdiction after review and approval by the Secretary of the Executive Office of Energy and Environmental Affairs of the Commonwealth of Massachusetts. If any occurrence ever gives rise to extinguishment or other release of this Conservation Restriction under applicable law, then Grantees, on a subsequent sale, exchange or involuntary conversion of the Premises, shall be entitled to a portion of the proceeds in accordance with Paragraph A above, subject, however, to any grant, agreement, or applicable law which expressly provides for a different disposition of proceeds.

C. Condemnation. Whenever all or any part of the Premises or any interest therein is taken by public authority under power of eminent domain or other act of public authority, then Grantor and Grantees shall cooperate in recovering the full value of all direct and consequential damages resulting from such action. All related expenses incurred by Grantor and Grantees shall first be paid out of any recovered proceeds. The remaining proceeds shall be distributed between Grantor and Grantees in shares equal in proportion to the aforementioned ratio (though if a less-than-fee interest is so taken, the proceeds shall be equitably allocated according to the nature of the interest taken), subject to any grant, agreement, or applicable law.

D. Continuing Trust of Grantees' Share of Proceeds. Grantees shall use their share of the proceeds in a manner consistent with the conservation purposes of this grant. Proceeds shall be divided between the Grantees with 14.5% directed to Grantee Mass Audubon and 13.5% to Grantee Eastham Conservation Foundation, each percentage representing the proportion of the respective Grantee's contribution to the Grantor's purchase price of the Premises.

VII. Subsequent Transfers

The Grantor agrees to incorporate by reference the terms of this Conservation Restriction in any deed or other legal instrument by which the Grantor divests any interest in all or a portion of the Premises. The Grantor shall notify the Grantees in writing if the Grantor conveys the Premises or any part thereof or interest therein (including a lease) within 21 days of such transfer. Failure to do any of the above shall not impair the validity or enforceability of this Conservation Restriction.

The Grantor shall not be liable for violations occurring after transfer of its ownership. Liability for any acts or omissions occurring prior to any transfer and liability for any transfer if in violation of this Conservation Restriction shall survive the transfer. Following said transfer, any new owner shall cooperate in the restoration of the Premises or removal of violations caused by prior owner(s) and may be held responsible for any continuing violations.

VIII. Estoppel Certificates

Upon request by the Grantor, the Grantees shall within twenty-one (21) days execute and deliver to the Grantor any document, including an estoppel certificate, which certifies the Grantor's compliance with any obligation of the Grantor contained in this Conservation Restriction.

IX. Effective Date

This Conservation Restriction shall be effective when the Grantor and the Grantees have executed the Conservation Restriction; the administrative approvals, including those required by Massachusetts General Laws Chapter 184, Section 32, has been obtained; and the Conservation Restriction has been recorded in a timely manner in the Barnstable Registry of Deeds.

X. Notices

Any notice, demand, request, consent, approval, or communication that either the Grantor or the Grantees desires or is required to give to the other shall be in writing and either served personally or sent by first-class mail, postage pre-paid, addressed as follows:

To Grantor: Town of Eastham
Eastham Conservation Commission
2500 State Highway
Eastham, MA 02642

To Grantees: Massachusetts Audubon Society
Director of Land Conservation
208 South Great Road
Lincoln MA 01733

And

Eastham Conservation Foundation
P.O. Box 183
Eastham, MA 02642

or such other address as either the Grantor or the Grantees from time to time shall designate by written notice to the other or that which is easily ascertainable.

XI. General Provisions

A. Controlling Law

The interpretation and performance of this Conservation Restriction shall be governed by the laws of the Commonwealth of Massachusetts.

B. Liberal Construction

Any general rule of construction to the contrary notwithstanding, this Conservation Restriction shall be liberally construed in favor of the grant to effectuate the purpose of this Conservation Restriction and the policy and purpose of Massachusetts General Laws, Chapter 184, and Sections 31-33. If any provision in this instrument is found to be ambiguous, an interpretation consistent with the purpose of this Conservation Restriction that would render the provision valid shall be favored over any interpretation that would render it invalid.

C. Severability

If any provision of this Conservation Restriction or the application thereof to any person or circumstance is found to be invalid, the remainder of the provision of this Conservation Restriction shall not be affected thereby.

D. Entire Agreement

This instrument sets forth the entire agreement between the Grantor and the Grantees with respect to the Conservation Restriction and supersedes all prior discussions, negotiations, understandings, or agreements relating to the Conservation Restriction, all of which are merged herein.

E. Pre-existing rights of the Public

Approval of this Conservation Restriction pursuant to Massachusetts General Laws Chapter 184, Section 32 by any municipal officials and by the Secretary of Energy and Environmental Affairs is not to be construed as representing the existence or non-existence of any pre-existing rights of the public, if any, in and to the Premises. Any such pre-existing rights of the public, if any, are not affected by the granting of this Conservation Restriction.

F. No Merger

No transfer of Grantor's or Grantees' interest in the Premises and no acquisition of any additional interest in the Premises by Grantor or Grantees shall cause this Conservation Restriction to merge with the fee or have the effect of causing any of the terms hereof to be rendered unenforceable by reason of the so-called "doctrine of merger," and no such transfer will be effective until this Conservation Restriction is assigned to a non-fee owner to ensure continued enforceability by a non-fee owner.

G. Enforcement Authority of the Attorney General

Grantor and Grantees hereby recognize the authority of the Massachusetts Attorney General pursuant to Massachusetts General Laws Chapter 12, Sections 3, 7 and 11D to, among

other things, prevent or remedy damage to the environment and to prosecute information or other processes against persons who intrude on the land, rights or property of the Commonwealth of Massachusetts (hereafter "Commonwealth"), or commit or erect a nuisance thereon. The Parties also recognize the interests of the Commonwealth in approving, enforcing and supporting conservation and other restrictions and the benefits to the public conferred by such restrictions acquired pursuant to Massachusetts General Laws Chapter 184, Sections 23 and 25 – 32. Accordingly, the Parties hereby consent to the Attorney General's enforcing the provisions of this restriction pursuant to Massachusetts General Laws Chapter 12, Sections 3, 7 and 11D, and Massachusetts General Laws Chapter 184, Sections 23 and 25 – 32. Such enforcement may include, among other things, the right to commence or intervene in any legal proceeding in order to secure the rights of the holder of a conservation restriction and the Commonwealth conferred under Massachusetts General Laws Chapter184, Sections 23, 25 – 32; the right to remedy past damage or prevent future damage to the environment as a result of actions or inactions on the part of an owner of land upon which a conservation or other restriction has been recorded; and the right to appeal any decision in any legal proceeding taken by any party that may affect the state interest and public benefit conferred by a restriction created pursuant to Massachusetts General Laws Chapter.184, Sections 23, 25 - 32.

H. Amendment

If circumstances arise under which amendment to or modification of this conservation restriction would be appropriate, Grantor and Grantees may by mutual written agreement jointly amend this conservation restriction, subject to the approval of the Secretary of Energy and Environmental Affairs; provided that no amendment may be made that will be inconsistent with Article 97 of the Amendments to the Massachusetts Constitution, Massachusetts General Laws Chapter 184, Section 32, the purposes of this Conservation Restriction, nor will affect its perpetual duration, nor adversely affect any of the significant conservation values of the Premises. Any such amendment shall be granted only in exceptional circumstances and shall be recorded with the Barnstable Registry of Deeds.

XII. Attachments and Exhibits

Attached hereto, and incorporated herein are the following:

Signatures:

Grantor – Town of Eastham Conservation Commission

Grantees: Massachusetts Audubon Society, Inc.

Eastham Conservation Foundation, Inc.

Approvals:

Town of Eastham Board of Selectmen

Secretary of the Executive Office of Energy and Environmental Affairs of the Commonwealth of Massachusetts

Exhibit A: Legal Description/Plan of Premises

Exhibit B: Eastham Town Meeting Vote

APPROVAL AND GRANT BY EASTHAM CONSERVATION COMMISSION

We, the undersigned, being a majority of the Conservation Commission of the Town of Eastham, Barnstable County, Massachusetts, hereby certify that the foregoing Conservation Restriction is approved and granted to Massachusetts Audubon Society, Inc. and Eastham Conservation Foundation, Inc. pursuant to Massachusetts General Laws Chapter 40, Section 8C, Massachusetts General Laws Chapter 44B and Massachusetts General Laws Chapter 184, Section 32, at a public meeting duly held on _____, _____.

TOWN OF EASTHAM
CONSERVATION COMMISSION

Chairman

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

On this 28th day of Jan, 2015, before me, the undersigned Notary Public, personally appeared James K Baughman, Thomas Durkin, Alex Pestaro, Sheila Filipowski and Steven LaBrant proved to me through satisfactory evidence of identification, which was/were Personal Knowledge + Driver's License to be the person(s) whose name(s) are signed on the preceding or attached documents, and acknowledged to me that he or she signed it voluntarily for its stated purpose as members of the Town of Eastham Conservation Commission.

Notary Public

Name: LAURA A GILLESPIE-LEE
Commission expires: Oct 8, 2021

APPROVAL BY TOWN OF EASTHAM BOARD OF SELECTMEN

We, the undersigned, being a majority of the Board of Selectmen of the Town of Eastham, Barnstable County, Massachusetts, hereby certify that the foregoing Conservation Restriction to Massachusetts Audubon society, Inc. and Eastham Conservation foundation, Inc.is approved and granted pursuant to Massachusetts General Laws Chapter 40, Section 8C, Massachusetts General laws Chapter 44B and Massachusetts General Laws Chapter 184, Section 32, at a public meeting duly held on _____, _____.

TOWN OF EASTHAM

BOARD OF SELECTMEN

_____ _____

_____ _____

_____

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

On this ___ day of _____, 2015, before me, the undersigned Notary Public, personally appeared _____, proved to me through satisfactory evidence of identification, which was/were _____ to be the person(s) whose name(s) are signed on the preceding or attached documents, and acknowledged to me that he or she signed it voluntarily for its stated purpose as members of the Board of Selectmen of the Town of Eastham.

_____
Notary Public

Commission expires:

ACCEPTANCE OF GRANT BY MASSACHUSETTS AUDUBON SOCIETY, INC. .

I, Gary Clayton, the undersigned, the duly authorized the President of the Massachusetts Audubon Society, Inc., hereby accept the foregoing Conservation Restriction from the Town of Eastham, acting by and through its Conservation Commission pursuant to Massachusetts General Laws, Chapter 184, Sections 31-33, and agree to be bound by its terms and further authorized my execution hereof.

Massachusetts Audubon Society, Inc.
BY: Gary Clayton

_____
Its: President
Duly authorized

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

On this _____ day of _____, _____, before me, the undersigned Notary Public, personally appeared Gary Clayton proved to me through satisfactory evidence of identification, which was/were _____ _____ to be the person(s) whose name(s) is/are signed on the preceding or attached documents, and acknowledged to me that he or she signed it voluntarily for its stated purpose as the President of the Massachusetts Audubon Society, Inc..

_____
Signature of Notary Public

_____
Printed name of Notary Public

_____
My Commission Expires (date)

(Place Notary seal or stamp above.)

ACCEPTANCE OF GRANT BY EASTHAM CONSERVATION FOUNDATION, INC.

I, Henry Lind the undersigned, being the duly authorized President of the Eastham Conservation Foundation, Inc. hereby accept the foregoing Conservation Restriction from the Town of Eastham, acting by and through its Conservation Commission pursuant to Massachusetts General Laws, Chapter 184, Sections 31-33, and agree to be bound by its terms and further authorized my execution hereof.

Eastham Conservation Foundation, Inc.
BY: Henry Lind

_____
Its: President
Duly authorized

COMMONWEALTH OF MASSACHUSETTS

Barnstable, ss.

On this _____ day of _____, _____, before me, the undersigned Notary Public, personally appeared Henry Lind proved to me through satisfactory evidence of identification, which was/were _____
_____ to be the person(s) whose name(s) is/are signed on the preceding or attached documents, and acknowledged to me that he or she signed it voluntarily for its stated purpose as the President of the Eastham Conservation Foundation, Inc..

_____
Signature of Notary Public

_____
Printed name of Notary Public

_____
My Commission Expires (date)

(Place Notary seal or stamp above.)

APPROVAL BY SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS COMMONWEALTH OF MASSACHUSETTS

The undersigned, Secretary of Executive Office of Energy and Environmental Affairs of the Commonwealth of Massachusetts, hereby certifies that the foregoing Conservation Restriction from the Town of Eastham acting by and through its Conservation Commission to the Massachusetts Audubon Society, Inc. and Eastham Conservation Foundation, Inc. has been approved in the public interest pursuant to Massachusetts General Laws, Chapter 184, Section 32.

Dated:

_____
Secretary of Energy and Environmental Affairs

COMMONWEALTH OF MASSACHUSETTS

_____, ss.

On this _____ day of _____, _____, before me, the undersigned Notary Public, personally appeared _____, proved to me through satisfactory evidence of identification, which was/were _____ _____ to be the person(s) whose name(s) is/are signed on the preceding or attached documents, and acknowledged to me that he or she signed it voluntarily for its stated purpose as Secretary of Energy and Environmental Affairs for the Commonwealth of Massachusetts.

_____
Signature of Notary Public

_____
Printed name of Notary Public

_____
My Commission Expires (date)

(Place Notary seal or stamp above.)

EXHIBIT A

PLAN OF LAND

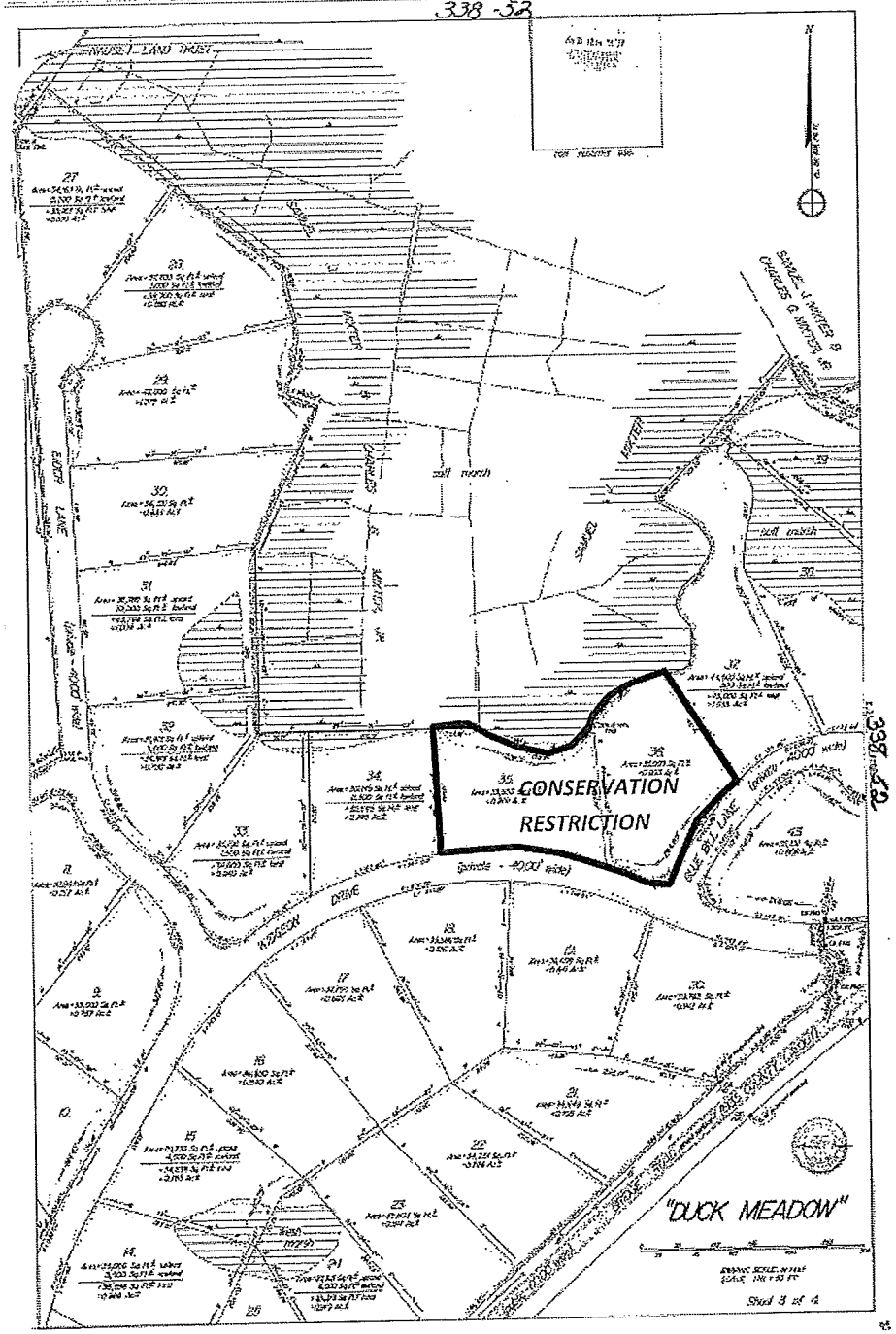


EXHIBIT B

TOWN MEETING VOTE

See Attached: Article _23_, Eastham Town Meeting, May 4, 2015

ARTICLE 23

To see if the Town will vote to authorize the Board of Selectmen to acquire by gift, purchase or eminent domain, a fee simple interest or less in two parcels of land located at 225 Widgeon Drive and 5 Blue Bill Lane, Eastham, to be held under the care, custody, management and control of the Conservation Commission for the purpose of creating in perpetuity a **Diamondback Terrapin Habitat** area for nesting, study, and preservation of the species, under such terms and conditions which the Board of Selectmen may impose; and as funding therefore to appropriate the sum of **$438,625** for the acquisition and other related costs associated therewith from the Community Preservation Open Space Reserves and/or the unrestricted reserves and/or borrow said total sum which shall be reduced by the amount of any grants or gifts received pursuant to the provisions of G. L. c. 44B, §11, G. L. c. 44, §7 or any other enabling authority, provided that no funds appropriated hereunder shall be expended until the Town receives gifts totaling a minimum of **$100,000** for the purposes of this Article; and further to authorize the Board of Selectmen to grant a perpetual conservation restriction on the property in accordance with the provisions of G. L. c.44B, §12 and c. 184, §§31-33 to a public or private nonprofit entity or government agency as the Board of Selectmen and the Conservation Commission deem appropriate; and further, to authorize the Board of Selectmen and the Conservation Commission to file on behalf of the Town any and all applications deemed necessary for grants and/or reimbursements from the Commonwealth of Massachusetts or any other grant programs; or take any action relative thereto.

By Board of Selectmen/Community Preservation Committee

Summary:
These properties comprise the most significant upland-nesting habitat on the Herring River Marsh for Diamondback Terrapins, designated by the State as a threatened species. If the town does not purchase these parcels, they will be marketed as house lots. A certified appraisal was submitted to the town in June 2014, for $650,000. Mass Audubon negotiated a reduced sale price of $538,625 including estimated closing costs and recording fees. A minimum of $100,000 will be contributed for this purchase by Mass Audubon, which will assign its purchase rights to the Town of Eastham.
BOARD OF SELECTMEN RECOMMENDATION: 5-0
FINANCE COMMITTEE RECOMMENDATION: 6-0
COMMUNITY PRESERVATION COMMITTEE: 6-0
(Majority vote required)

ARTICLE 24

To see if the Town will vote to transfer the sum of **$30,000** from Community Preservation Historic Preservation Reserves, to be expended as a grant from the Town to the Eastham Historical Society, a non-profit corporation, for the purpose of preserving a structure on its property at 2375 Route 6, known as the **1936 Dill Beach Camp**; and further to authorize the Board of Selectmen to enter into a grant agreement with the Eastham Historical Society under such terms and conditions as the Town Administrator shall deem appropriate; or take any action relative thereto.

By Board of Selectmen/Community Preservation Committee

Summary:
This article will provide funding to make necessary repairs to the last remaining Eastham fishing camp cottage, now located near the Swift-Daley House Museum. The Dill Beach Camp was part of the outer bank cottages made famous by Henry Beston in his book, *The Outermost House.*
BOARD OF SELECTMEN RECOMMENDATION: 5-0
FINANCE COMMITTEE RECOMMENDATION: 6-0
COMMUNITY PRESERVATION COMMITTEE: 6-0
(Majority vote required)

Information

ABCC APPROVED
BOARD to Sign Feb 16/16

LICENSE #036400045
ALCOHOLIC BEVERAGES
THE LICENSING BOARD OF
The Town of Eastham
MASSACHUSETTS
HEREBY GRANTS A

COMMON VICTUALLER

License to Expose, Keep for Sale, and to Sell

All Kinds of Alcoholic Beverages

To Be Drunk On the Premises

To **Sandpipers Sports Pub, Inc. dba Sandpipers Sports Pub**
4940 State Highway – Robin Wignot, Manager

on the following described premises One story building with dining room/lounge (2,250 sq. ft.), foyer (140 sq. ft.), dining room (978 sq. ft.), kitchen (1,302 sq. ft.), five bathrooms and hall (370 sq. ft.), two coolers, office and storage (411 sq. ft.), and basement for storage (5,040 sq. ft.). Four entrance/exits located at the west, south, and east sides of the building. One exterior entrance/exit to storage area only and one bulkhead to basement. The entire building premises are to be licensed. Total square footage = 10,491.

This license is granted and accepted upon the express condition that the licensee shall, in all respects, conform to all the provisions of the Liquor Control Act, Chapter 138 of the General Laws, as amended, and any rules or regulations made thereunder by the licensing authorities. This license expires December 31st, 2016, unless earlier suspended, cancelled or revoked.

IN TESTIMONY WHEREOF, the undersigned have hereunto affixed their official signatures this sixteenth day of February, 2016.

The Hours during which Alcoholic
Beverages may be sold are from:
10:00 a.m. to 1:00 a.m.
unless otherwise specified by Board
of Selectmen or State Statutes
Sunday opening at noon

.....
.....
.....
.....
.....
LICENSING BOARD

ALL DRINKS MUST BE OFF THE TABLES BY CLOSING TIME

COMMONWEALTH OF MASSACHUSETTS
TOWN OF EASTHAM
BOARD OF SELECTMEN

This is to certify that:

Sandpipers Sports Pub

Is hereby granted a license for
Coin-Operated Amusements – Weekday and Sunday Hours

This license is issued in conformity with MGL c. 140 s. 177A and ordinances relating thereto, and expires December 31, 2016 unless sooner suspended or revoked.

Date of Issue: February 2, 2016
Permit Number: CO2016- 3
Fee: $150.00

COMMONWEALTH OF MASSACHUSETTS
TOWN OF EASTHAM
BOARD OF SELECTMEN

This is to certify that:

Sandpipers Sports Pub

Is hereby granted a Common Victualler's License

This license is issued in conformity with the authority granted to the licensing authorities by Massachusetts General Laws Chapter 140 Sections 5-6 and Chapter 94 Sections 1-9A, and amendments thereto, and expires December 31, 2016 unless sooner suspended or revoked.

Date of Issue: February 2, 2016
Permit Number: CV2016- 23
Fee: $100.00

COMMONWEALTH OF MASSACHUSETTS
TOWN OF EASTHAM
BOARD OF SELECTMEN

This is to certify that:

Sandpipers Sports Pub

Is hereby granted a license for Billiards

This license is granted in conformity with the Statutes and ordinances relating thereto, and expires December 31, 2016 unless sooner suspended or revoked.

Date of Issue: February 2, 2016
Permit Number: BLD2016- 4
Fee: $100.00

_____
_____
_____
_____
_____

Elizabeth Shaw

From: nuendelcapecod@aol.com
Sent: Friday, February 05, 2016 8:49 AM
To: admin@eastham-ma.gov
Subject: For the BOS
Attachments: Completed Petition.pdf

Dear Eastham BOS,

Attached please find the first of several submissions of a petition signed by those in favor of pursuing a memorandum of agreement with Stratford Capital Group. I realize we are late on the scene, after the Citizens' Group quickly organized and became very vocal. I beg to ask you to reconsider, as those in favor make themselves heard, completing an M of A with input from interested parties as to what we would like to see on this site in Eastham. Respectfully, Bonnie Nuendel 508-255-6305 255 Meetinghouse Rd. Eastham 02642

nuendelcapecod@aol.com

We, the undersigned registered voters of Eastham, MA, wish to demonstrate our support for the Affordable Housing neighborhood proposed by Stratford Capital Partners for the former Tee Time Driving Range site on Route 6 in North Eastham.

The Town of Eastham has the lowest percentage of affordable housing (1.9% of year round housing units) of any town on Cape Cod. The creation of 115 rental apartments will meet a significant portion of the needs outlined in the Towns Affordable Housing Needs Assessment and is consistent with the Board of Selectmen's Fiscal Year 16 Goals.

Any development at this site raises concerns about traffic and safety. We encourage the Board of Selectmen and Stratford Capital Partners to work together with other community stakeholders, the Cape Cod Commission, and the Massachusetts Department of Transportation to develop plans to minimize traffic congestion and improve safety on Route 6 in the vicinity of the proposed development.

We believe that by working together, the Town and Stratford Capital can address resident's concerns and create much needed affordable homes in our Community.

1. Gladys Valerio
2. Marcana Valerio
3. Bruce Wendel
4. Brigette West
5. Donald V. Wendel
6. James Higgins
7. Matt Wendel
8. Elaine Cary
9. Sasha Foley
10. James Milliken
11. [illegible]
12. Willis Dain Kim

BOS info

Gillespie-Lee, Laurie

From: Scott Andersen <skarock111@yahoo.com>
Sent: Sunday, February 07, 2016 11:13 AM
To: gawronsoncapecod@comcast.net; knightflight12@hotmail.com; burtl@nausetschools.org; wallace.adams@comcast.net; boshea@navizone.com; Gillespie-Lee, Laurie
Subject: T-Time

Good Morning

Thank you for your no vote on Monday night related to the T-Time proposal, hopefully it will finally put an end to this nightmare. The Stratford proposal is a perfect example of how to build affordable housing the wrong way. It's time to close this chapter, say goodbye to Stratford, and move forward with affordable housing the right way.

We were very happy to hear the recommendation by the citizens group to take the land by eminent domain and want to emphasize our strong support for this proposal, as well as focusing on the Purcell property. It will give us the opportunity to all work together on affordable housing and the future of Eastham, and prevent another Stratford from threatening our beautiful town.

Thanks again,
Scott and Patti Andersen
630 Herringbrook Road

Sent from my iPad

Nauset Public Schools

78 Eldredge Park Way, Orleans, Massachusetts 02653
Phone: 508-255-8800 • Fax: 508-240-2351 • http://nausetschools.org

Mr. Thomas M. Conrad
Superintendent of Schools

Keith E. Gauley
Assistant Superintendent

Dr. Ann M. Caretti
Director of Student Services

Giovanna B. Venditti
Director of Finance and Operations

Barbara Lavoine
Director of Technology

VOTE OF THE NAUSET REGIONAL SCHOOL DISTRICT
SCHOOL COMMITTEE

I, the Secretary (the "District Secretary") of the School Committee (the "Committee") of the Nauset Regional School District, Massachusetts (the "District"), certify that at a meeting of the Committee held February 4, 2016, of which meeting all members of the Committee were duly notified and at which a quorum was present, the following votes were unanimously passed, all of which appear upon the official record of the Committee in my custody:

Voted: that we hereby determine, in accordance with G.L. c. 70B, that the amount of the cost of the (i) Middle School project authorized by a vote of the School Committee passed on November 13, 2014 not being paid by the school facilities grant is at least $796,576, and (ii) High School project authorized by a vote of the School Committee passed on October 5, 2011 not being paid by the school facilities grant is at least $2,709,484, and we hereby approve of the issuance of notes and bonds in such amount under said G.L. c. 70B and we hereby approve of the issuance of notes and bonds in such amounts under said G.L. c. 70B.

Further Voted: that the sale of the $3,506,060 General Obligation Bonds of the District dated February 1, 2016 (the "Bonds"), to Roosevelt & Cross, Inc. at the price of $3,568,513.03 is hereby approved and confirmed. The Bonds shall be payable on February 1 of the years and in the principal amounts and bear interest at the respective rates, as follows:

Year	Amount	Interest Rate	Year	Amount	Interest Rate
2017	$181,060	2.00%	2026	$175,000	2.00%
2018	175,000	2.00	2027	175,000	2.00
2019	175,000	3.00	2028	175,000	2.00
2020	175,000	2.00	2029	175,000	2.25
2021	175,000	2.00	2030	175,000	2.50
2022	175,000	2.00	2032	350,000	3.00
2023	175,000	2.00	2034	350,000	3.00
2024	175,000	2.00	2036	350,000	3.00
2025	175,000	2.00			

Further Voted: that the Bonds maturing on February 1, 2032, February 1, 2034, and February 1, 2036 (each a "Term Bond") shall be subject to mandatory redemption or mature as follows:

Term Bond due February 1, 2032

Year	Amount
2031	175,000
2032*	175,000

*Final Maturity

Term Bond due February 1, 2034

Year	Amount
2033	$175,000
2034*	175,000

*Final Maturity

Term Bond due February 1, 2036

Year	Amount
2035	$175,000
2036*	175,000

*Final Maturity

Further Voted: that in connection with the marketing and sale of the Bonds, the preparation and distribution of a Notice of Sale and Preliminary Official Statement dated January 13, 2016, and a final Official Statement dated January 26, 2016 (the "Official Statement"), each in such form as may be approved by the District Treasurer, be and hereby are ratified, confirmed, approved and adopted.

Further Voted: that the District Treasurer and the Chair of the Committee be, and hereby are, authorized to execute and deliver a continuing disclosure undertaking in compliance with SEC Rule 15c2-12 in such form as may be approved by bond counsel to the District, which undertaking shall be incorporated by reference in the Bonds for the benefit of the holders of the Bonds from time to time.

Further Voted: that we authorize and direct the District Treasurer to establish post issuance federal tax compliance procedures in such form as the District Treasurer and bond counsel deem sufficient, or if such procedures are currently in place, to review and update said procedures, in order to monitor and maintain the tax-exempt status of the Bonds.

Further Voted: that each member of the Committee, the District Secretary and the District Treasurer be and hereby are, authorized to take any and all such actions, and

execute and deliver such certificates, receipts or other documents as may be determined by them, or any of them, to be necessary or convenient to carry into effect the provisions of the foregoing votes.

I further certify that the votes were taken at a meeting open to the public, that no vote was taken by secret ballot, that a notice stating the place, date, time and agenda for the meeting (which agenda included the adoption of the above votes) was filed with the Town Clerks of each of the member towns of Brewster, Eastham, Orleans and Wellfleet, Massachusetts (collectively, the "Town Clerks") and a copy thereof posted in a manner conspicuously visible to the public at all hours in or on the municipal buildings in which the offices of the Town Clerks and the District Secretary are located, or in accordance with an approved alternative method of notice prescribed or approved by the Massachusetts Attorney General as set forth in 940 CMR 29.03(4), at least 48 hours, not including Saturdays, Sundays and legal holidays, prior to the time of the meeting and remained so posted at the time of the meeting, that no deliberations or decision in connection with the sale of the Bonds were taken in executive session, all in accordance with G.L. c.30A, §§18-25 as amended.

Dated: February 4, 2016

Ann M. Tefft, District Secretary

Submitted to Cape Cod Commission 1/15/16

COPY

APPLICATION FOR STATE DISTRICT LOCAL TECHNICAL ASSISTANCE (DLTA) FUNDS 2016
JANUARY 12, 1016

WEB BASED COMPREHENSIVE HEALTH PERMITTING PROGRAM

SUBMITTED BY:
Town of Eastham

PROJECT TEAM:
Paul Lagg, Town Planner
Jane Crowely, Health Agent
Susan Barker, Assistant Health Agent
Edward Rohmer, IT Director

DLTA FUNDING REQUEST:
$18,000 - $25,000

PROJECT PROPOSAL:
The Town of Eastham proposes to extend its current web based permitting software (PeopleForms) to the Eastham Health Department. In 2015, the Town successfully launched web based permitting for Building, Plumbing and Electrical permits. Expanding this technology to our Health Department will allow our core regulatory permits to be processed on a shared software platform that is web based, intuitive and highly scalable to a variety of data management needs.

PROJECT NEED:
Health permitting for the Town of Eastham is currently managed through rudimentary spreadsheets and manual hard copy processes. This reduces our staff productivity and decreases our ability to properly manage and integrate our data with local, County and State departments and agencies.

Health permitting (along with Building and Conservation) is one of our three core regulatory areas and represents a significant portion of our staff resources. In addition to the health related regulatory responsibilities shared amongst other communities, Eastham also has additional responsibilities unique to our community, related to ongoing monitoring of private wells and public drinking water supply wells located throughout the town. *(these functions are also managed through a rudimentary Access database).* The Town manages a robust monitoring program with a significant amount of data processing. This program also requires a significant level of oversight, coordination and reporting with the Barnstable County Department of Health and Environment.

The Town has been conducting a self audit of our IT infrastructure. The deficiencies in our current data management capabilities and the need to integrate our Health data on a standard software platform has been identified as a priority. Implementing this software will enable the Town to link water quality data to local and County GIS mapping. This is an important component as we consider implications of nitrate/nitrogen impacts on our watersheds.

MERITS OF THE PROJECT:

Eastham recognizes the importance of implementing Best Management Practices into our internal processes. Eastham is currently one of only four municipalities on the Cape and Islands participating in Governor Baker's Community Compact program. Eastham has signed onto the Compact under the following areas:

- BUSINESS CONTINUITY
- TRANSPARENCY
- COMPREHENSIVE WATER RESOURCE MANAGEMENT

This proposal will allow Eastham to incorporate Best Management Procedures in all three of the categories listed above.

BUSINESS CONTINUITY

Best Practice: There is a written disaster recovery and backup plan for critical municipal systems along with a documented plan to transfer paper documents to an electronic format and securely store backup electronic municipal data in locations geographically separated from the primary source.

- *Hard copy data will be migrated to digital format, scanned and linked via common parcel ID. New data will be processed digitally in a standardized software platform. Web based program maintains secure backup procedures via off site servers. Eastham has formed an internal Technology Work Group in order to draft comprehensive disaster recovery plan.*

TRANSPARENCY

Best Practice: There is a documented open data strategy including timelines for making municipal spending and budget information accessible from the city or town website in a machine readable and graphical format.

- *Eastham Building permits are currently processed on the proposed web based software platform. Migrating Health data onto the shared platform is an important step in increasing data transparency. Once the software has been configured, The Town will be in position to offer 24/7/365 web based permitting options to the public. This proposal also includes configuration of automated reporting which will increase Eastham's capacity to offer real time budget information via the Town's website.*

COMPREHENSIVE WATER RESOURCE MANAGEMENT

Best Practice: There is a plan to supply and conserve water, manage storm water, and treat and reuse wastewater; The MA Water Conservation Standards are being implemented; Municipal regulations promote green infrastructure and the use of low impact development techniques; An Enterprise Fund or other mechanism is in place to fund maintenance and replacement of water infrastructure.

- *Eastham is currently implementing Phase 1 of our Municipal Public Water Supply Project. The project is being carried out in accordance with the BMP's listed above. It is anticipated that the proposed software platform will be used in coordination with our public water supply asset management software. This will increase our capacity to monitor and analyze data to implement low impact development techniques and prudent water conservation practices.*

This proposal is an important piece of Eastham's plan to update its IT infrastructure. The proposal is in line with established best management practices and also serves to strengthen the regional digital systems already being used in numerous towns within Barnstable County.*(Peopleforms software is currently used to manage a variety of datasets in the towns of Chatham, Dennis, Provincetown, Brewster, Mashpee, Falmouth and Nantucket).*

Thank you for your consideration. Please feel free to contact our project team if you have nay questions or would like additional information.

Core Software Functions:

- Food Establishments
- Septage Haulers
- Septic Installers
- Hotel/Motel Inspections
- Tobacco Sales
- Water Quality Database
- Automated Reports
- Inspection Tracking
- Water Quality Data link to Local and County GIS
- Integration with Eastham Building Permits

Attachments:

Letters of Support
Sample Permit Template
Sample License Template
Sample Report Template
Example - Automated License Renewal Process

Town of Chatham
Department of
Natural Resources

Health (508) 945-5165
Water Quality Laboratory (508) 945-5188
Conservation (508) 945-5164
Coastal Resources (508) 945-5176
Shellfish (508) 945-5184
Harbormaster (508) 945-5185

FAX (508) 945-5163
261 George Ryder Road Chatham, MA 02633

January 15, 2016

Patty Daley
Deputy Director
Cape Cod Commission
3225 Main St.
Barnstable, MA 02630

Dear Ms. Daley,

I am writing in support of the Town of Eastham's request for funds as part of the Commissions District Local Technical Assistance (DLTA) Grant.

The Town of Chatham, Health Division, has recently developed and instituted a licensing software, using PeopleGIS, web based database system. We have created, with the technical assistance of the PeopleGIS staff, a standardized software platform, and have streamlined our functions for licensing our customers in Chatham. Currently we are using the program for the licensing of Food Service Establishments, Septic Installers, Septage Haulers, Hotel/Motels, Tobacco Sales, etc. We have found this program to be user friendly and simple to modify as needed, and are actively developing online licensing procedures and payments for our customers.

I believe the format we have created can be easily modified for the use of other communities to stream line and standardize their licensing programs. In addition there is an added benefit of having additional communities utilizing the same software. This will allow future enhancements to be carried out in coordination, and allow regional customers familiarity and ease of use in the future.

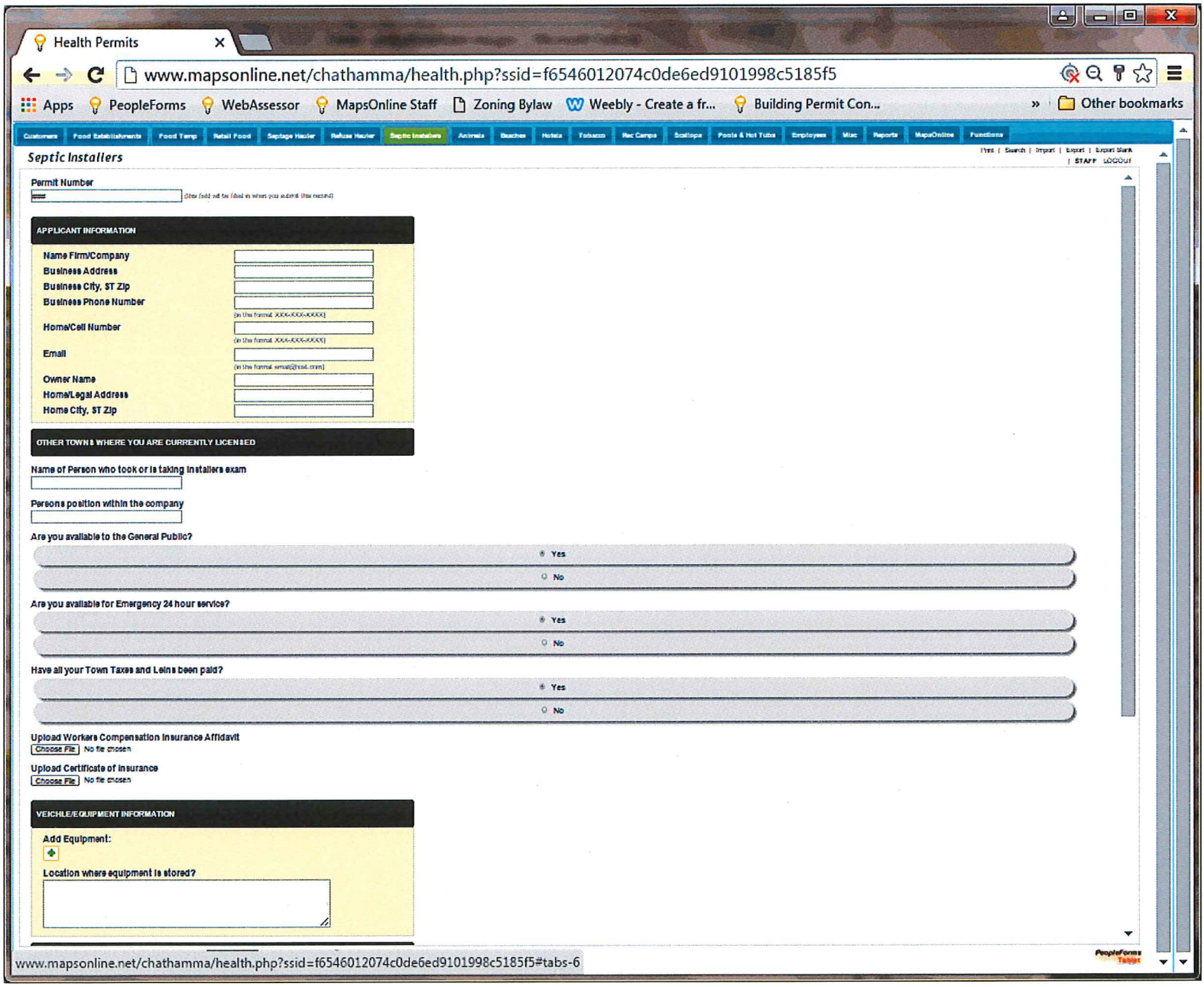
If you have any questions or wish to see our program firsthand, please contact me at this office, Monday through Thursday from 7:00 AM to 4:00 PM, and Friday 7:00 AM to 12:30 PM.

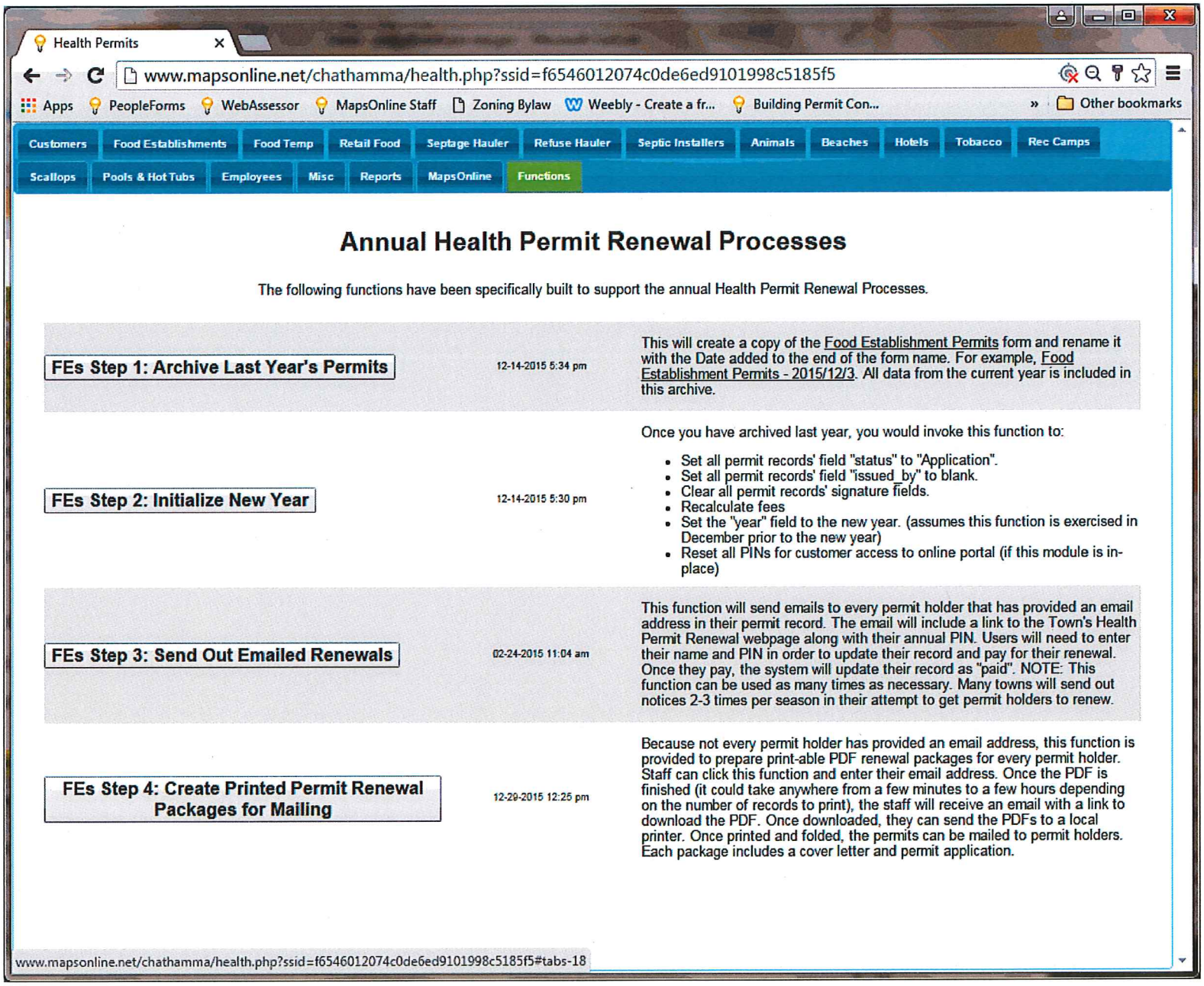
Respectfully,

Judith H. Giorgio

Judith H. Giorgio, R.S., M.P.H.
Health Agent

Cc: Chairman, Board of Health
Robert Duncanson, Director of Health and Environment
File


Health Permits
www.mapsonline.net/chathamma/health.php?ssid=f6546012074c0de6ed9101998c5185f5
Apps
PeopleForms
WebAssessor
MapsOnline Staff
Zoning Bylaw
Weebly - Create a fr...
Building Permit Con...
Other bookmarks
Septic Installers
Permit Number
APPLICANT INFORMATION
Name Firm/Company
Business Address
Business City, ST Zip
Business Phone Number
Home/Cell Number
Email
Owner Name
Home/Legal Address
Home City, ST Zip
OTHER TOWNS WHERE YOU ARE CURRENTLY LICENSED
Name of Person who took or is taking installers exam
Persons position within the company
Are you available to the General Public?
Yes
No
Are you available for Emergency 24 hour service?
Yes
No
Have all your Town Taxes and Leins been paid?
Yes
No
Upload Workers Compensation Insurance Affidavit
Choose File
No file chosen
Upload Certificate of Insurance
Choose File
No file chosen
VEICHLE/EQUIPMENT INFORMATION
Add Equipment:
Location where equipment is stored?
www.mapsonline.net/chathamma/health.php?ssid=f6546012074c0de6ed9101998c5185f5#tabs-6


Health Permits
www.mapsonline.net/chathamma/health.php?ssid=f6546012074c0de6ed9101998c5185f5
Apps
PeopleForms
WebAssessor
MapsOnline Staff
Zoning Bylaw
Weebly - Create a fr...
Building Permit Con...
Other bookmarks
Customers
Food Establishments
Food Temp
Retail Food
Septage Hauler
Refuse Hauler
Septic Installers
Animals
Beaches
Hotels
Tobacco
Rec Camps
Scallops
Pools & Hot Tubs
Employees
Misc
Reports
MapsOnline
Functions
Annual Health Permit Renewal Processes
The following functions have been specifically built to support the annual Health Permit Renewal Processes.
FEs Step 1: Archive Last Year's Permits
12-14-2015 5:34 pm
This will create a copy of the Food Establishment Permits form and rename it with the Date added to the end of the form name. For example, Food Establishment Permits - 2015/12/3. All data from the current year is included in this archive.
FEs Step 2: Initialize New Year
12-14-2015 5:30 pm
Once you have archived last year, you would invoke this function to:
Set all permit records' field "status" to "Application".
Set all permit records' field "issued_by" to blank.
Clear all permit records' signature fields.
Recalculate fees
Set the "year" field to the new year. (assumes this function is exercised in December prior to the new year)
Reset all PINs for customer access to online portal (if this module is in-place)
FEs Step 3: Send Out Emailed Renewals
02-24-2015 11:04 am
This function will send emails to every permit holder that has provided an email address in their permit record. The email will include a link to the Town's Health Permit Renewal webpage along with their annual PIN. Users will need to enter their name and PIN in order to update their record and pay for their renewal. Once they pay, the system will update their record as "paid". NOTE: This function can be used as many times as necessary. Many towns will send out notices 2-3 times per season in their attempt to get permit holders to renew.
FEs Step 4: Create Printed Permit Renewal Packages for Mailing
12-29-2015 12:25 pm
Because not every permit holder has provided an email address, this function is provided to prepare print-able PDF renewal packages for every permit holder. Staff can click this function and enter their email address. Once the PDF is finished (it could take anywhere from a few minutes to a few hours depending on the number of records to print), the staff will receive an email with a link to download the PDF. Once downloaded, they can send the PDFs to a local printer. Once printed and folded, the permits can be mailed to permit holders. Each package includes a cover letter and permit application.
www.mapsonline.net/chathamma/health.php?ssid=f6546012074c0de6ed9101998c5185f5#tabs-18

FOR BOARD OF HEALTH USE ONLY

Date Received	Date Inspected	Approved By	Permit # Issued

SAMPLE

Food Establishment Permit Application

(Application must be submitted at least 30 days before the planned opening date)

Establishment Name:		
Establishment Address: , **Chatham, MA 02633**		
Establishment Mailing Address (if different): ,		
Establishment Telephone No:		
Applicant Name & Title:	Email:	
Applicant Address: ,		
Applicant Telephone No:	24 Hour Emegency No:	
Owner Name & Title (if different from Applicant):		
Owner Address (if different from Applicant):		
Establishment Owned By: ☐ Association ☐ Corporation ☐ Individual ☐ Partnership ☐ Other _____		
If a corporation or partnership, provide Name, Title, and Home Address of officers or partners:		
Person Directly Responsible for Daily Operations (Owner, Person-in-Charge, Supervisor, Manager, etc.)		
Name & Title:	Email:	
Address: ,		
Phone No:	Fax:	
Emergency Phone:		
District or Regional Supervisor (if applicable)		
Name & Title:	Email:	
Address: ,		
Phone No:	Fax:	
Emergency Phone:		
Name of Person In Charge Certified in Food Protection Management: *Required as of 10/1/2001 in accordance with 105 CMR 590.003(A) Please attach copy of certificate.*		

Water Source:	Sewage disposal:
DEP Public Water Supply No (if applicable):	No. of Food Employees:

Days & Hours of Operation:	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Open Time							
Close Time							

Person Trained in Anti-Choking Procedures (if 25 seats or more): ☐ Yes ☐ No

Location: *(check one)*

☐ Permanent Structure
☐ Mobile

Length of Permit: *(check one)*

☐ Annual
☐ Seasonal/Dates:
to

Establishment Type: *(check all that apply)*

☐ Retail – No Seats/Non PHFs (_____ sq. ft.)
☐ Retail – With Food Services (_____ sq. ft.)
☐ Food Service – Dine In (0 seats)
☐ Food Service – Takeout
☐ Food Service – Institution (_____ meals/day)
☐ Frozen Dessert Manufacturer
☐ Retail – With PHFs
☐ Caterer
☐ Mobile Food
☐ Residential Kitchen for Retail Sale
☐ Residential Kitchen for B&B Home
☐ Residential Kitchen for B&B Est.

Other (Describe):

Food Operations: *(check all that apply)*

Definitions: PHF – potentially hazardous food (time/temperature controls required)
Non-PHFs – non-potentially hazardous food (no time/temperature controls required)
RTE – ready-to-eat food (Ex. sandwiches, salads, muffins which need no further processing)

☐ Sale of Commercially Pre-Packaged Non-PHFs
☐ Sale of Commercially Pre-Packaged PHFs
☐ Delivery of Packaged PHFs
☐ Reheating of Commercially Processed Foods for Service within 4-Hrs
☐ Customer Self-Service of Non-PHF and Non-Perishable Foods Only
☐ Preparation of Non-PHFs
☐ PHF Cooked To Order
☐ Preparation of PHFs for Hot and Cold Holding for Single Meal Service
☐ Sale of Raw Animal Foods Intended to be Prepared by Consumer
☐ Customer Self-Service
☐ Ice Manufactured and Packaged for Retail Sale
☐ Juice Manufactured and Packaged for Retail Sale
☐ Offers RTE PHF in Bulk Quantities
☐ Retail Sale of Salvage, Out-of-Date or Reconditioned Food
☐ Hot PHF Cooked and Cooled or Hot Held for more than a Single Meal Service
☐ PHF and RTE Foods Prepared for Highly Susceptible Population Facility
☐ Vacuum Packaging/Cook Chill
☐ Use of Process Requiring a Variance and/or HACCP Plan (including bare hand contact alternative, time as a public health control)
☐ Offers Raw or Undercooked Food of Animal Origin
☐ Prepares Food/Single Meals for Catered Events or Institutional Food Service

Other (Describe):

To be completed by the Board of Health:

Total Permit Fee: **$0.00**

Payment if due with application

I, the undersigned, attest to the accuracy of the information provided in this application and I affirm that the food establishment operation will comply with 105 CMR 590.000 and all other applicable law. I have been instructed by the Board of Health on how to obtain copies of 105 CMR 590.000 and the Federal Food Code.

Signature of Applicant: _____

Pursuant to MGL Ch. 62C, sec. 49A, I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid state taxes required under law.

Social Security Number or Federal ID: _____

Signature of Individual or Corporate Name: _____

The Commonwealth of Massachusetts
Town of Chatham

Septic Installer License

Fee
125.00
Date Issued
Dec 28, 2015
License Number
SI-46

Applicant: T.W. Nickerson, Inc.
160 Mill Hill Road
S. Chatham MA 02659

SAMPLE

IS HEREBY GRANTED A LICENSE

This license is granted in conformity with the statutes and ordinances relating thereto, and expires Dec 31, 2016 unless sooner suspended or revoked.

Conditions:

Judith Giorgio
Health Agent

Town of Chatham, Massachusetts

Health Permit Payments

Date Range: 01/03/2016 - 01/09/2016

Food Establishment Permit

Permit #	Pay Date	Business Name	Received From	Type	Amount
F-32	01/04/2016	New England Pizza House #3	Malita Family Corp.	CHK (8229)	$ 225.00
F-39	01/04/2016	Chatham Bars Inn - Tavern	CBI Operations LLC	CHK (72582)	$ 225.00
F-40	01/04/2016	Chatham Bars Inn - Main Dining Room	CBi Operations LLC	CHK (72582)	$ 275.00
F-41	01/04/2016	Chatham Bars Inn - Beach House Grill	CBI Operations LLC	CHK	$ 275.00
F-91	01/04/2016	Chatham Cookware	Chatham Cookware	CHK (7576)	$ 125.00
F-8	01/05/2016	Captain's House Inn	Meyer B&B Group, Inc.	CHK (4794)	$ 125.00
F-67	01/06/2016	Chatham Penny Candy Store	Cory Metters	CHK (4791)	$ 75.00
				Total Food Establishment Permit Payments:	**$ 1,325.00**

Total All Payments: **$ 1,325.00**

Submitted 1/15/16

COPY

APPLICATION FOR STATE DISTRICT LOCAL TECHNICAL ASSISTANCE (DLTA) FUNDS 2016
JANUARY 15, 2016

Nauset Estuary Integrated Approach to Watershed Nutrient Management

SUBMITTED BY:
Town of Eastham

PROJECT TEAM:
Jane Crowley, Health Agent
Paul Lagg, Town Planner

DLTA FUNDING REQUEST:

$25,000	Site specific approach: Permeable Reactive Barrier Site (PRB) Characterization Salt Pond, Eastham-Nontraditional Pilot Project Demonstration
$10,000	Shared water shed collaboration approach: Facilitate collaboration of towns within Nauset Estuary watershed to determine nutrient load allocation and joint evaluation of existing and expanded water quality data
$35,000	**Total Request**

PROJECT PROPOSAL & NEED:
This proposal contains two components. Both components address wastewater planning through a shared watershed approach. Both components include a collaborative process among multiple government entities. **The attached documents provide detailed information on the proposed project.**

Component 1: Pilot Project: Nontraditional Permeable Reactive Barrier (PRB) Characterization- Salt Pond
The goal of this component is to establish a successful pilot demonstration site for non-traditional methods for nutrient management.

The Town of Eastham would like the Salt Pond Visitor Center located within the Cape Cod National Seashore (CCNS) to be considered as a demonstration site for Permeable Reactive Barrier (PRB) technology. Salt Pond is located entirely within the Town boundaries of Eastham. However, Salt Pond is a significantly impaired water body within the Nauset Harbor Embayment System which is shared by the Towns of Eastham and Orleans and the CCNS. According to the Massachusetts Estuaries Project (MEP), this system is currently over its critical nitrogen loading limit and requires 100 percent removal of nitrogen. A project at this site to address nitrogen impacts to this water body provides a unique opportunity to partner with the Cape Cod National Seashore. Eastham has sought prior funding for this pilot project through the USEPA Region 1 PRB Site Characterization Grant program *(see attached supporting material).* While this proposal did not receive funding, it was acknowledged that the location comprises an excellent demonstration site for the proposed PRB technology. The Cape Cod National Seashore has endorsed the project and is willing to partner with Eastham *(see attached letter of support).*

Component 2: Shared watershed collaboration - Nauset Estuary

The goal of this component is to facilitate collaboration among towns within the Nauset Estuary watershed to determine nutrient load allocation and joint evaluation of existing and expanded water quality data.

The Town of Eastham and the Town of Orleans share a portion of the watershed within the within Nauset Estuary. Salt Pond and portions of the Nauset Estuary also fall within the Cape Cod National Seashore. Funding this proposal will help to facilitate discussions about shared watershed responsibilities and load allocation. Collaboration on evaluation of existing and expanded water quality data will improve our ability to make joint decisions regarding appropriate approaches to reduce nutrient loads within the shared watershed; with the goal achieving TMDL's that meet water quality standards. In addition, the Salt Pond pilot demonstration site will provide invaluable information to the Town of Orleans and other communities within Barnstable County which may be interested in non-traditional approaches to nutrient management. It is anticipated that both components of this proposal will serve to enhance regional collaboration and inform future watershed based wastewater planning.

MERITS OF THE PROJECT:

Watershed based approach to nutrient management:

- *Per 208 Plan recommendation*

Inter-governmental collaboration (Eastham, Orleans, Cape Cod National Seashore):

- *Per priority requirements listed in DLTA funding guidelines.*

Potential for regional application of non-traditional methods for nutrient management:

- *Per 208 Plan recommendation and Community Compact Best Management Practices for Comprehensive Water Resource Management*

Thank you for your consideration. Please feel free to contact our project team if you have any questions or would like additional information.

Attachments:

Eastham Salt Pond Phase 1

Permeable Reactive Barrier (PRB) Initial Site Characterization

Project Kickoff and Work Plan Approval **$3,010**

Well Locations Determination and Meeting **$1,800**

Installation of Groundwater Wells **$8,820**

Plan and oversee installation of two (2) monitoring wells to include but not be limited to:

- Drill boring to determine the depth of the aquifer (estimated to be 30-40 ft.)
- Install wells
- Collect sediment samples at appropriate intervals to characterize the aquifer materials. Measure field water-quality characteristics (specific conductance, dissolved oxygen and field nitrate concentration).
- Install water-level data loggers in selected wells to determine temporal variations in water levels.

Collect and Analyze Groundwater and Soil Samples **$2,720**

Collect and analyze groundwater and soil samples as detailed below:

- Chemical analysis of water samples should include field water-quality characteristics (specific conductance, pH, dissolved oxygen, alkalinity), major cations and anions, nutrients (N species and phosphate), dissolved organic carbon, and selected minor elements (iron, manganese, boron).
- Soil characterization (hydrogeology, groundwater flux, geotechnical properties of soils)

Meetings **$5,330**

Provide regular communication with and progress updates, including attendance at two (2) additional meetings.

Deliverables **$3,320**

Draft Technical Memo for review, then Final Technical Memorandum, revised based on Town comments

Total **$25,000**

Nauset Estuary Watershed Nutrient Load Allocation
Joint Evaluation of Existing and Expanded Water Quality Data

Project kick off and determine work plan objectives **$1000**

Meetings and Analysis

- Facilitate discussion of shared loads in Nauset Estuary with appointed watershed stakeholders with progress updates (minimum 2 meeting)
- Share existing water quality data and compile report/trend analysis
- Develop logistics for expanded sampling program
- Review results of new data/expanded analysis to establish current conditions **$6330**

Deliverables

Draft Technical Memo for review and Final Technical Memo based on workgroup progress on water quality conditions. **$2670**

Total **$10,000**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

June 1, 2015

Dear Cape Cod Communities in Buzzards Bay and the South Coast:

EPA Region 1 would like to make you aware of a new and exciting opportunity to work with EPA and its partners to perform hydrogeological site characterizations. The objective of these site characterizations is for the design of Permeable Reactive Barriers (PRBs) as pilot technologies for reducing the concentration of nitrogen (N) compounds in groundwater. As part of its Southeast New England Program (SNEP), EPA Region 1 will partner with the United States Geological Survey (USGS) and the Cape Cod Commission (CCC) to:

- Help identify suitable locations for PRB nitrogen removal pilots,
- Fully characterize one or more sites to support PRB design, and
- Provide an example of the type of site characterization work necessary for a successful PRB installation.

EPA is undertaking this work directly because of EPA's strong interest in supporting MA Department of Environmental Protection's Cape Cod TMDLs for total nitrogen and the Clean Water Act section 208 water quality plan update developed by the CCC. EPA intends to take the lessons learned from this project to help demonstrate and encourage the priorities set forth by the Southeast New England Program. These priorities include the application of innovative technologies and the reduction of nitrogen pollution throughout southeast New England.

Project Description

Selected municipalities in southern and western Cape Cod are invited to propose sites for hydrogeological site characterizations in support of PRBs as pilot technologies by responding to this solicitation letter. Interested municipalities should refer to information at the bottom of this letter on applying. Pre-application technical assistance is available to assist municipalities with site nominations, as described below.

Once replies are received, a technical team consisting of EPA Region 1, the CCC, and the USGS, will review responses and begin to identify sites that appear to be suitable locations for PRB nitrogen reduction pilot tests. EPA will select sites with input from the technical team. At sites selected through this process, EPA and its partners will perform an Initial Site Characterization that is expected to include: the installation of monitoring wells (and associated elevation surveys); measurements of depth to groundwater; preliminary identification of low hydraulic-conductivity layers in the potential treatment zone; identification of the presence and depth of saltwater interface; the collection and lab analysis of groundwater samples for water-quality constituents; and evaluation of preliminary field and lab data. If a site selected for an Initial Site Characterization has already had some level of site characterization work done, additional data collected at this stage will be used to augment existing data.

Data from the Initial Site Characterizations will then be evaluated for selection of one or more sites for a full-scale hydrogeological assessment that will fill in data gaps and support needs for PRB design. This full-scale assessment will more fully characterize each site and will provide additional data to support

PRB design. Additional details will vary based on the site's characteristics, but the full-scale hydrogeological assessment may include: measurement of horizontal and vertical hydraulic gradients; location of freshwater aquifer boundaries and saltwater interface; determination of hydraulic conductivity, lithologic variability and estimation of groundwater flow rate in the potential treatment zone; concentrations of nitrogen and other water-quality constituents; and installation of additional up- and down-gradient monitoring wells and potentially site specific/regional groundwater modeling for PRB design.

EPA anticipates that initial site characterizations and full-scale hydrogeological assessments will be on municipal, state or federal lots/parcels or easements. Once the full-scale hydrogeological assessment has been completed, a final site report will be generated based on interpretations of field, lab and modeling data. This report may then be used by the municipality as the basis for a pilot PRB at the characterized site.

EPA anticipates entering into a Memorandum of Understanding (MOU) with the selected municipality to work cooperatively to monitor the success of the project, develop an operation and maintenance protocol and schedule (if appropriate), and educate the public and other municipal officials throughout the Cape and from other cities and towns. We anticipate that the entire length of the characterization project for a site that proceeds to a full-scale hydrogeological assessment will be approximately 12 months.

Selection Criteria

The primary factor in selecting sites will be based on a review of the apparent technical feasibility of constructing an effective PRB onsite. EPA may also consider geographic location as a selection criterion in order to ensure regional distribution of SNEP funds. The technical team will make recommendations for site selection to EPA based on the following criteria:

- Favorable watershed condition
    - Areas with high rates of N loading to estuary
    - Areas with proximal dense up-gradient N sources (minimizes uncertainties about origin of N load to be treated)
    - Areas proximal to affected water bodies (minimizes speed of estuarine water-quality improvement)
- Favorable hydrogeological conditions
- Areas that have some level of previous hydrogeologic investigation
    - Areas with shallow groundwater (in order to minimize cost)
    - Areas with high groundwater flow rates associated with either steep hydraulic gradients or higher hydraulic conductivities
    - Areas with geologic characteristics that are representative of southern New England
    - Areas with less than a 50 feet thick saturated potential treatment zone
- Prioritize areas with access
    - Town-owned land
    - Open areas away from structures
    - Road, electric or rail rights-of-way (perpendicular to groundwater flow)
- Prioritize areas that avoid permitting issues (e.g. wetlands)

Communities eligible to apply

Although the Southeast New England Program (SNEP) covers Southern Cape Cod to Pleasant Bay and includes the Islands, for this project EPA plans to partner with a subset of municipalities located

specifically on Cape Cod[1]. Eligible municipalities are those with watersheds that have a hydrological connection (via surface water or groundwater) to either Buzzards Bay or the south coast of Cape Cod. Proposed sites must be located within eligible watersheds that drain to one of these areas. Eligible watersheds are all located east of the Cape Cod Canal and south of Route 6. Municipalities with watersheds in these areas include: a portion of Bourne, Falmouth, a portion of Sandwich, Mashpee, Barnstable, Yarmouth, Dennis, Harwich, and Chatham. Funding constraints, SNEP priorities, and the fact that EPA is supporting the section 208 wastewater management plan necessitate this focus.

How to apply to this solicitation

We are inviting municipalities that are interested in the installation of a PRB for N removal to propose sites for this project. If you are interested, please submit a brief statement of interest (no more than 1-3 pages, exclusive of maps and figures) to Marcel Belaval (belaval.marcel@epa.gov) and Karen Simpson (Simpson.karen@epa.gov) **no later than COB July 1, 2015**. This statement should include the following:

Component	Required	If available
Site must be within the geographic area for eligible communities (Visit the PRB Project Siting Viewer to determine whether or not your site is within this area)	X	
Identify the lot (or portion thereof) easement and/or parcel number, including a point of contact for the property, a street address and/or other information useful to identifying the location (e.g. utility pole #). Describe the site, including the size, and justification for why you selected the site. (Note: the proposed site should not be located on or near soils contaminated or potentially contaminated with oil or hazardous waste.)	X	
Specify your community's interest in this project, willingness to enter into an MOU with EPA, and participate and facilitate in project planning and coordination (as appropriate)	X	
Specify how soon site characterization work could begin	X	
Describe any support or in-kind services your community is willing to provide (Note: there is no match requirement)	X	
Include the name, email, and phone number of a municipal point of contact. If the project is selected, this person will need to be the lead on this project and be willing and able to work with EPA	X	
Verify your willingness to show other municipalities the site and data for the duration of the project and beyond, should a pilot PRB be constructed on the site	X	
Identify where a PRB could be located within the project area , and identify the proposed characterization area		X
Describe the site history and any known prior uses		X
Include existing site-specific hydrogeologic and water-quality information (e.g. nitrogen concentrations, groundwater contours, depth to groundwater, approximate aquifer thickness or target) saturated zone, groundwater travel time, availability of existing borings, monitoring wells, assessments)		X

[1] For a visual representation of eligible municipalities, be sure to turn on the "South-facing Embayments" GIS layer of the PRB Project Siting Viewer which is located at: http://gis-services.capecodcommission.org/apps/JS_Developing/prb/viewer.html

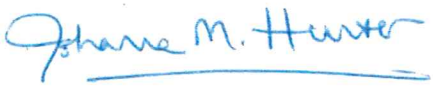
Describe the expected potential for groundwater nitrogen reduction utilizing a PRB; include supporting information used to create this estimate such as estimated PRB size, influent N loads, etc.		X
Describe the location of the lot in relation to nearby water bodies; also include whether those water bodies are impaired (listed under Class 4a or 5 of the MA Integrated List of Waters) or are adversely affected by excessive nitrogen loading (for information on impaired waters, please visit the following link: http://www.mass.gov/eea/agencies/massdep/water/watersheds/total-maximum-daily-loads-tmdls.html)		X
Photos or site plans		X

The technical team will review all submittals and may conduct site visits and/or interviews prior to making a selection. After submissions have been received, the technical team may schedule a visit for the most promising sites to better understand the site and/or collect additional information that may help us in reviewing proposals. EPA will select sites for characterization work with input from the technical team. EPA expects to notify communities within a few weeks once EPA has made its selections. If selected, the municipality will need to provide EPA and its contractor(s) access to the site (via an access agreement) for the length of the project.

Pre-application technical assistance is available for municipalities to assist with responding to this solicitation. CCC has made geographic and hydrologic data available online at: http://gis-services.capecodcommission.org/apps/JS_Developing/prb/viewer.html. In addition, the Watershed Multi-Variant Planner, which can be found at www.watershedmvp.org, may assist you in compiling and assessing data for nominating sites in your town.

Finally, **EPA Region 1, the CCC, and the USGS will hold an open information session for all interested applicants on June 10th at 11:00 AM in the Innovation Room on the Barnstable County Campus** to provide additional information to municipalities interested in responding. To RSVP for this information session, and/or for additional questions or assistance, please contact Marcel Belaval at (617) 918-1239 or Belaval.marcel@epa.gov, or Karen Simpson at (617) 918-1672 or Simpson.karen@epa.gov.

Thank you for your interest in this matter. Please pass this along to community stakeholders who may be interested and eligible. We look forward to hearing from you.



Johanna M. Hunter
Chief, Watershed & Non-Point Source Unit
Office of Ecosystem Protection
US EPA Region 1
5 Post Office Square, Suite 100, Mail Code: OEP06-01
Boston, MA 02109-3912
(617) 918-1041

TOWN OF EASTHAM

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

TO Marcel Belaval and Karen Simpson, USEPA Region 1

FROM Jane Crowley, R.S.,M.S., Eastham Health Agent, jcrowley@eastham-ma.gov

Phone: (508) 240-5900 ext. 229

RE Statement of Interest: Permeable Reactive Barrier Site Characterizations

DATE June 30, 2015

INTRODUCTION

The Town of Eastham is submitting this statement of interest in response to the United States Environmental Protection Agency's (USEPA) announcement dated June 1, 2015; for the site characterization opportunity for the design of Permeable Reactive Barriers (PRBs).

The Town of Eastham would like to be considered for this opportunity at the Salt Pond Visitor Center within the Cape Cod National Seashore (CCNS) as a demonstration site for the PRB technology. Salt Pond is a significantly impaired waterbody within the Nauset Harbor Embayment System which is shared by the Town of Eastham and Orleans and the CCNS. Salt Pond is located entirely within the Town boundaries of Eastham and according to the Massachusetts Estuaries Project (MEP), is currently over its critical nitrogen loading limit and requires 100 percent removal of nitrogen. A project at this site to address nitrogen impacts to this waterbody provides a unique opportunity to partner with the Cape Cod National Seashore and provide inter-governmental support to the project. The Cape Cod National Seashore has stated that they endorse the project and a letter of support is attached to this Statement of Interest. Although this site is not within the bounds of the Southeast New England Program, groundwater flows in a southerly direction and into a Cape Cod embayment that is subject to a nitrogen TMDL and part of the Massachusetts Estuaries Project.

SALT POND SITE

Site Location

Salt Pond is home to the Cape Cod National Seashore's main Visitor Center which is located at 50 Nauset Road at the corner of Nauset Road and Route 6 in Eastham, MA (Map 12 Parcel 314). Water direction flows southerly from Salt Pond into the Nauset Marsh. Eastham is not within the geographic area for eligible communities, but would like to be considered as it shares the same impacts as other Cape communities. Eastham is looking to partner with the Cape Cod National Seashore which extends southerly through Chatham to the southern coast and because of the favorability of the site and existing information would be a benefit to all communities considering PRBs as part of their solution.

The Town proposes siting at this location based on the relative availability and 26 acres of publicly owned land (Municipal and Federal), high nitrogen removal requirements and availability of groundwater monitoring data. The improvements in water quality that could be realized at a site downgradient from the Eastham Landfill would be an added benefit and make for an ideal project location.

Schedule

There are no known scheduling constraints for this property; work could begin as soon as soon as appropriate following appropriate coordination with CCNS and Eastham.

PRB Location

The general PRB location proposed is shown on Figure 1. A PRB at the site would be proposed to run along the western boundary of the property along Route 6 (north along the property) and then follow the entrance to the CCNS parcel and extend eastward in the general area of the existing bike path. The PRB length would be dependent on whether approval within the 100-foot buffers would be permitted. A second location could also be explored between the Visitor Center and Salt Pond in order to treat the wastewater effluent generated from the Visitor Center's on-site I/A system. This second or alternative location would be dependent on whether work could be permitted within the 100-foot buffer. A photo of Salt Pond from the Visitor Center is also included as an attachment to this Statement of Interest.

Site History and Hydrogeologic Conditions

The site is currently adjacent to the Cape Cod National Seashore's Salt Pond Visitor Center and is downgradient of the Town's Landfill. There has been significant study and hydrogeological assessments performed upgradient of the site in the vicinity of the Eastham Landfill due to the 1,4-Dioxane levels found in the groundwater/ private drinking water wells. The USEPA has also partnered with the Town to assist with field sampling of wells related to tracking the landfill plume. Attached to this Statement of Interest are figures demonstrating some of the available data in this area that would be beneficial to a PRB site assessment and piloting project, including:

- Estimated Groundwater Flow Patterns, Vicinity of Eastham Landfill dated 12/2014
- Comprehensive Site Assessment dated 1/2015
- Section Lines and Profiles dated 11/2014

Waste Site Cleanup reports are also filed with the Massachusetts Department of Environmental Protection (MassDEP) on a quarterly basis and can be provided as part of the in-kind services. In addition, previous work has been done by the United States Geological Survey (USGS) hydrologists John Masterson and John Coleman who have modeled flow path in this area.

In addition to the on-going groundwater landfill work; the Town of Eastham has had an extensive private well sampling program in place since 2003 for nitrates including a rigorous testing program for real estate transactions and rental properties. Figures representing the nitrate analysis program at various time intervals are also attached to this Statement of Interest.

Groundwater flows in a southerly direction from Salt Pond to Nauset Marsh. Depth to groundwater estimated by the Cape Cod Commission's PRB Viewer ranges from less than 40 to less than 4 feet. As shown in Figure 2, the proposed PRB location is outside of the Old Town Center Historic Districts and Estimated Priority Habitats, and as stated above its length and location will need to be adjusted based on actual wetland buffer determinations or shortened to not extend as far to the east to avoid these all together.

Additional Background

Eastham is proactively working on the priorities outlined in the 2009 Final Interim Needs Assessment and Alternatives Analysis Report as discussed below:

- Human Health Need: Public water supply for all properties. After years of trying to gain public support, public water was recently approved at Town Meeting.
- Environmental Health Need: Wastewater and phosphorus management to address water quality problems in the Freshwater Pond System Watershed. Herring and Great Ponds have been treated with alum and show improved water quality.

The outstanding wastewater priority is now a focus of the Town:

- Environmental Health Need: Wastewater and nitrogen management to meet project nitrogen limits in the Nauset-Town Cove Estuary

Eastham recently was awarded a MassDEP Water Infrastructure Planning and Technical Assistance Grant to upgrade their 2009 plan and coordinate regional planning efforts with the Cape Cod Commission's 208 plan. Remediation of the nitrogen entering Salt Pond is an important step in the Town's wastewater management.

CONCLUSION

It is expected that the installed PRB will achieve full denitrification of nitrified groundwater and bring the nitrate values in groundwater passing through the PRB to zero for the Salt Pond site. Site characterization would hopefully be used to then estimate the total nitrogen removal potential of a PRB of certain length and depth.

The Town of Eastham is willing to provide in-kind services with community outreach, technical support to provide water quality data and GIS mapping, and information from any monitoring wells in Town including wells installed for monitoring of 1,4-Dioxane.

The Town of Eastham would greatly appreciate the opportunity to serve as a demonstration community for the PRB technology and is willing to share data and information to support future municipal projects. Characterization at Salt Pond will provide knowledge that is universally transferrable given the constrained watershed and extensive hydrogeology known at this site.

The Town of Eastham is very interested in this request for responses and hopes to be considered for this PRB opportunity and is willing to enter into a MOU with the EPA. We would like our partnering spirit with the USEPA to continue for the health of Eastham's residents and the health of our important environmental resources here and throughout Cape Cod.

The municipal point of contact for this response is:

Jane Crowley

Jane Crowley, R.S.,M.S., Health Agent
Town of Eastham Health Department; 2500 State Highway, Eastham, MA 02642
Phone: 508-240-5900 x229; Email: jcrowley@eastham-ma.gov

United States Department of the Interior

NATIONAL PARK SERVICE
Cape Cod National Seashore
99 Marconi Site Road
Wellfleet, MA 02667
508.771.2144
508.349.9052 Fax

IN REPLY REFER TO:
A3415

June 30, 2015

Marcel Belaval and Karen Simpson
Watershed and Non-point Source Unit
Office of Ecosystem Protection
US EPA Region 1
5 Post Office Square, Suite 100, Mail Code: OEPO-01
Boston, MA 02109-3912

RE: Letter of Support for Town of Eastham request for Salt Pond as candidate for EPA Technical assistance to determine hydrogeologic site characterization for nontraditional technologies

Dear Mr. Belaval and Ms. Simpson:

Please accept this letter of support for Town of Eastham's proposal to consider Salt Pond as an excellent location to evaluate and demonstrate application of non-traditional Permeable Reactive Barrier (PRB) technology to improve water quality.

The staff of Cape Cod National Seashore supports this partnership with Eastham to investigate strategies to protect and improve water quality to Salt Pond and the Nauset Marsh Estuary. The objectives are consistent with the Cape Cod National Seashore Water Resource Management Plan.

Salt Pond water quality is significantly impaired. This location would serve as an excellent pilot demonstration site with knowledge that could be applicable elsewhere. Characterization will be universally transferable. The Town of Eastham and Cape Cod National Seashore have extensive hydrogeologic work conducted in a constrained watershed including nitrogen testing data down gradient of Eastham Landfill with 3-D ground water profiling and modeling, and almost 10 years of water quality sampling data from Salt Pond monitoring stations.

Eastham was previously supported by US EPA field Environmental Scientists to conduct wide scale well testing for VOC's and the emerging contaminant 1, 4 Dioxane in this same area in

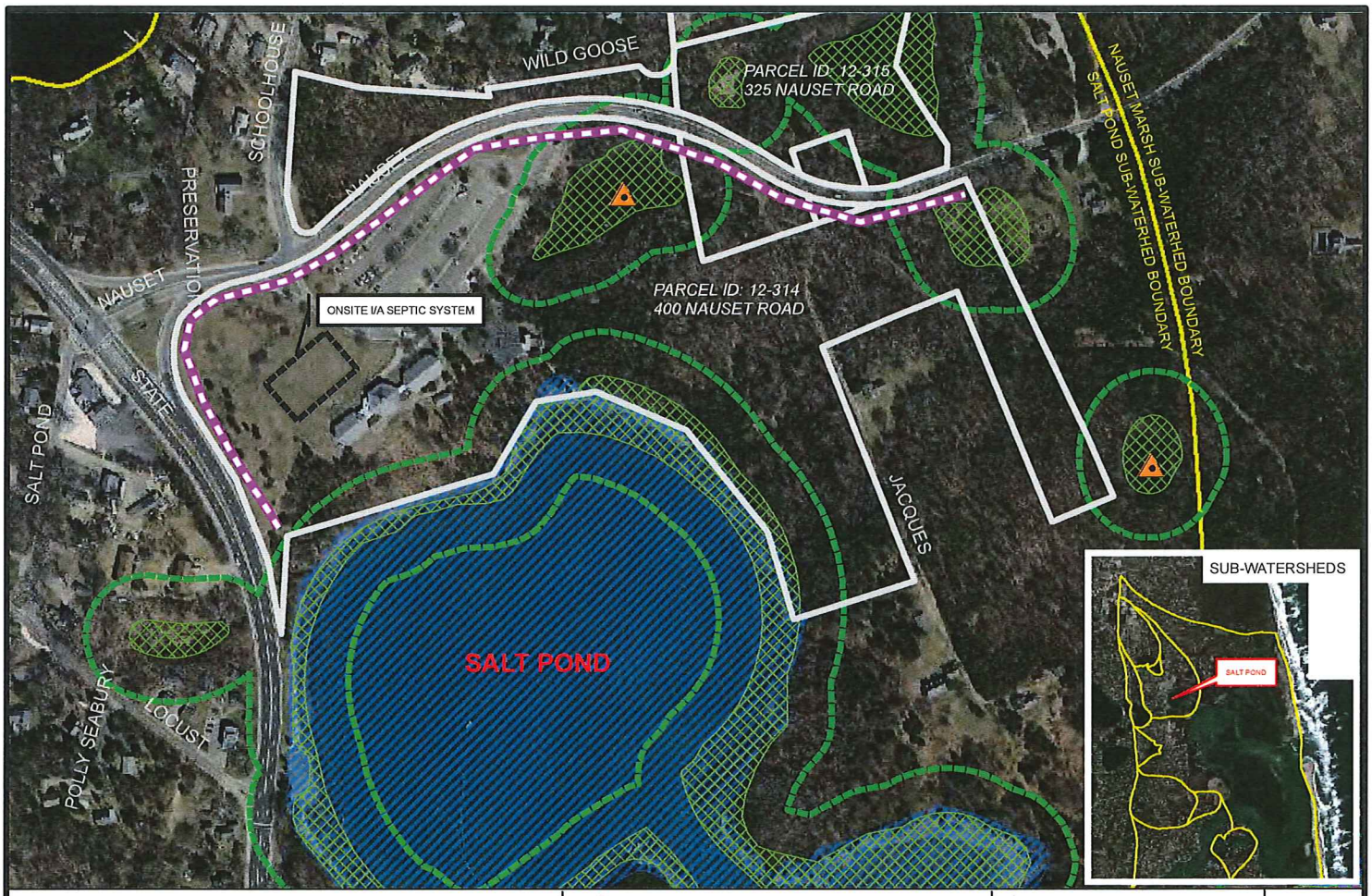
2013. Cape Cod National Seashore fully supports the Town of Eastham to select the Salt Pond site for further evaluation.

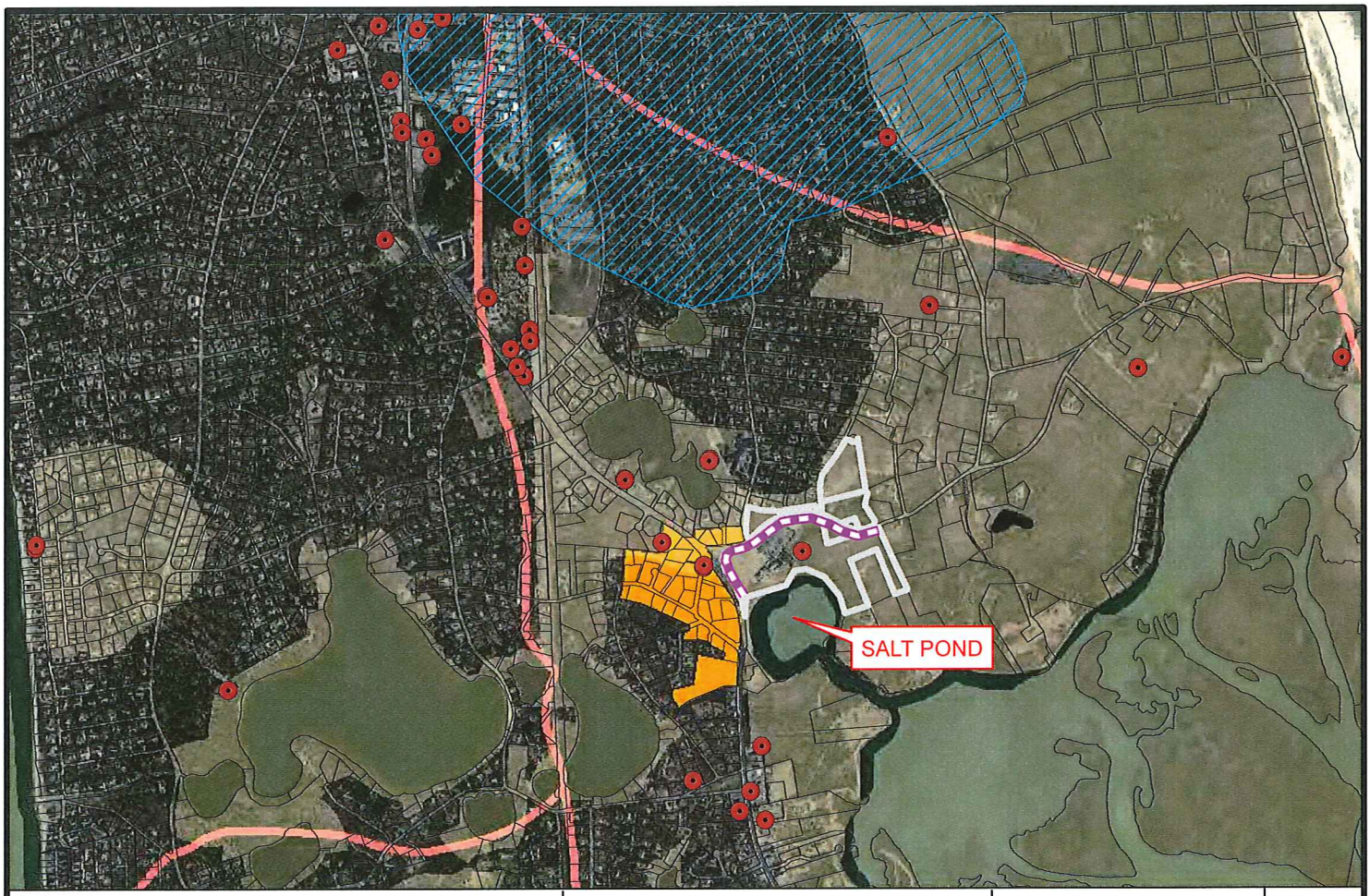
Thank you for consideration.

Sincerely,

George E. Price, Jr.
Superintendent

PRB Proposed Site – Figures and Photo


WILD GOOSE
PARCEL ID: 12-315
325 NAUSET ROAD
NAUSET MARSH SUB-WATERHED BOUNDARY
SALT POND SUB-WATERHED BOUNDARY
SCHOOLHOUSE
NAUSET
PRESERVATION
NAUSET
STATE
ONSITE I/A SEPTIC SYSTEM
PARCEL ID: 12-314
400 NAUSET ROAD
SALT POND
JACQUES
SALT POND
POLLY SEABURY
LOCUST
SUB-WATERSHEDS
SALT POND
CERTIFIED VERNAL POOLS
POTENTIAL PERMEABLE REACTIVE BARRIER
NATIONAL SEASHORE PROPERTY
DEP WETLANDS
100 FOOT BUFFER WETLANDS
FEMA FLOOD ZONE AE
SUB-WATERSHEDS
Town of Eastham
SALT POND STUDY AREA
MAP 1: ENVIRONMENTAL
AERIAL PHOTO: 2014
0 100 200 400 Feet
N



PUBLIC SUPPLY WELLS
ZONE II
EMBAYMENTS
POTENTIAL PERMEABLE REACTIVE BARRIER
NATIONAL SEASHORE PROPERTY
ESTIMATED PRIORITY HABITAT
OLD TOWN CENTER HISTORIC DISTRICT

Town of Eastham
SALT POND STUDY AREA
MAP 2: REGULATORY

AERIAL PHOTO: 2014

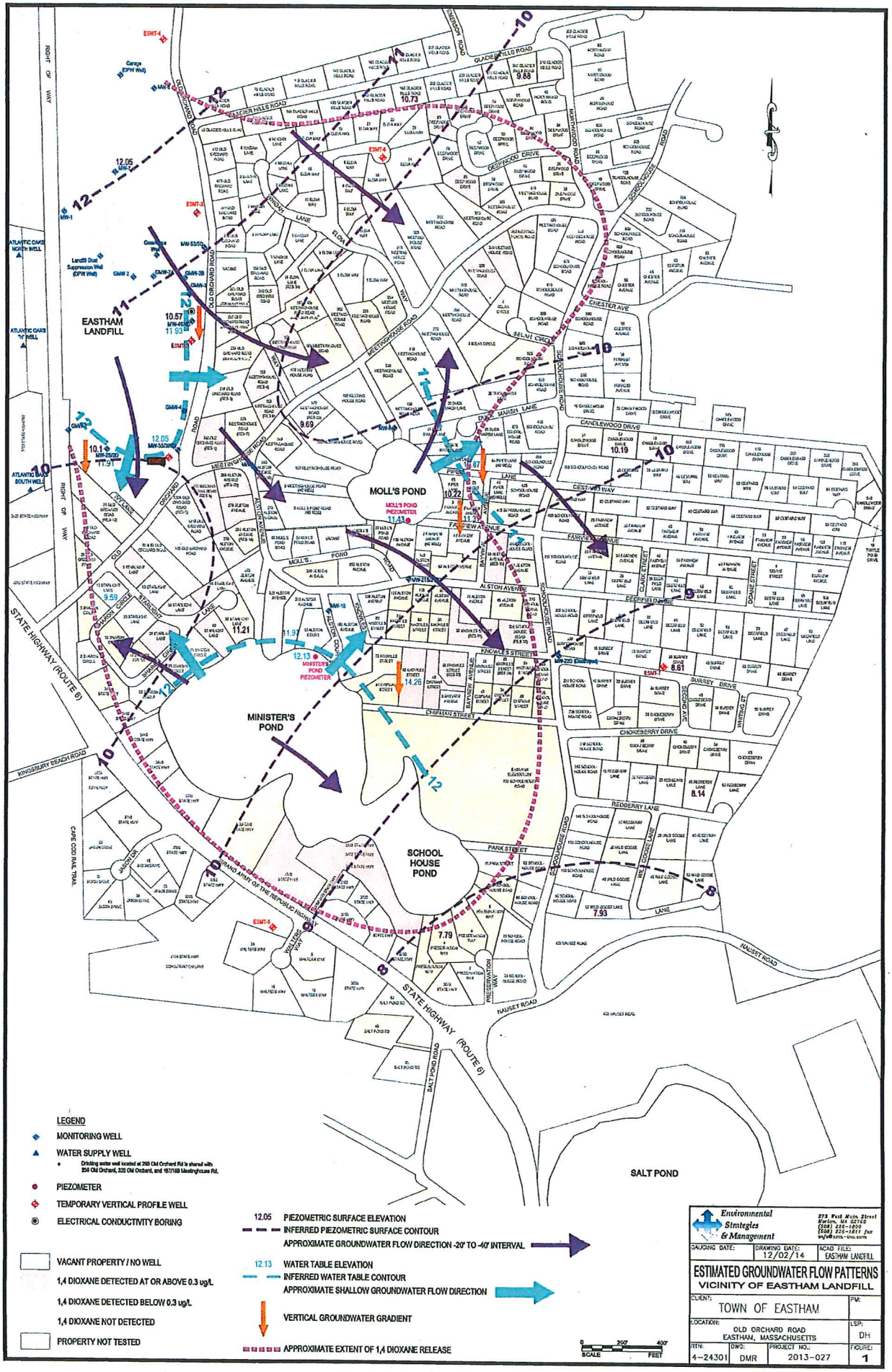
0 500 1,000 2,000 Feet

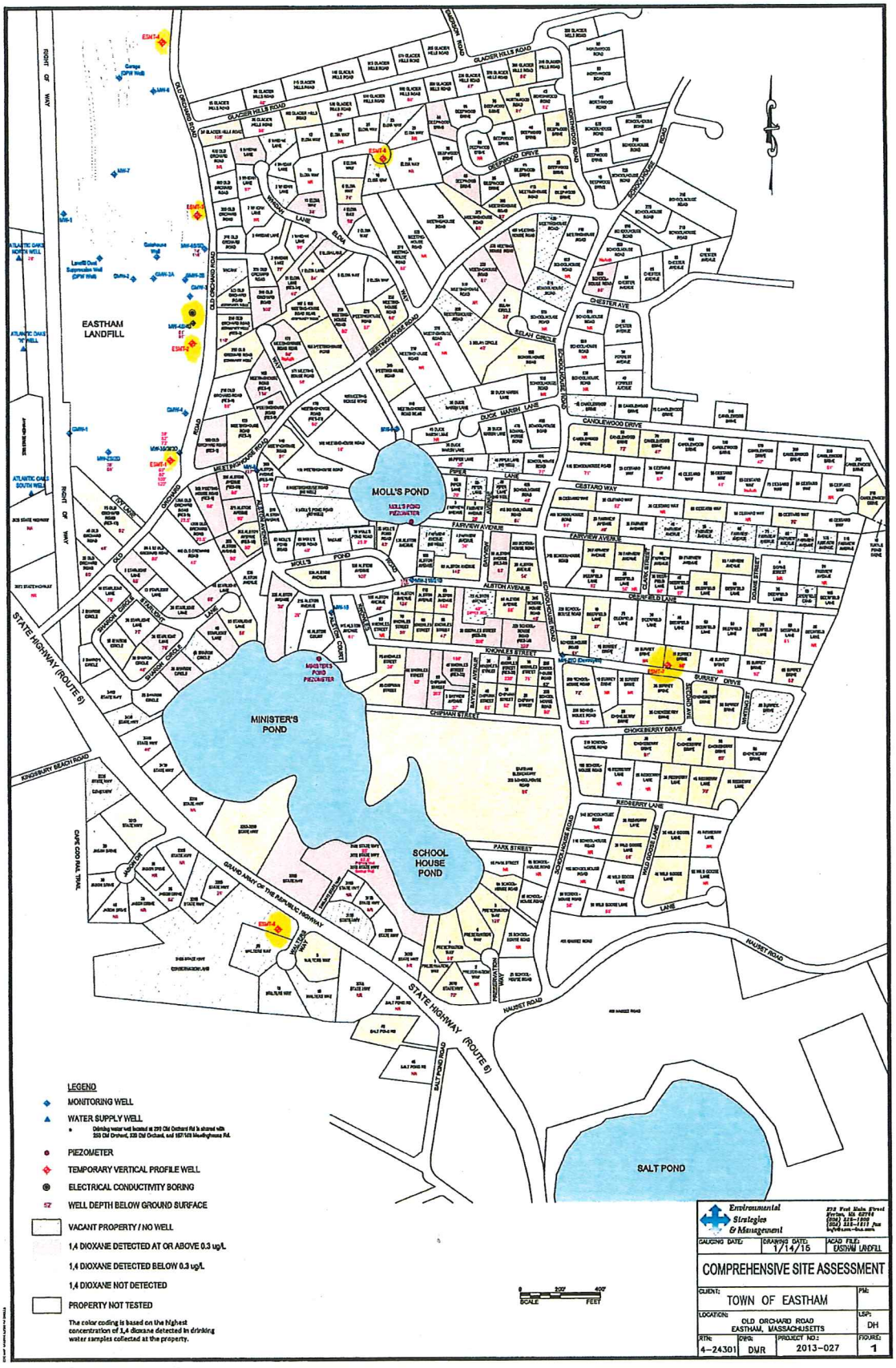
N

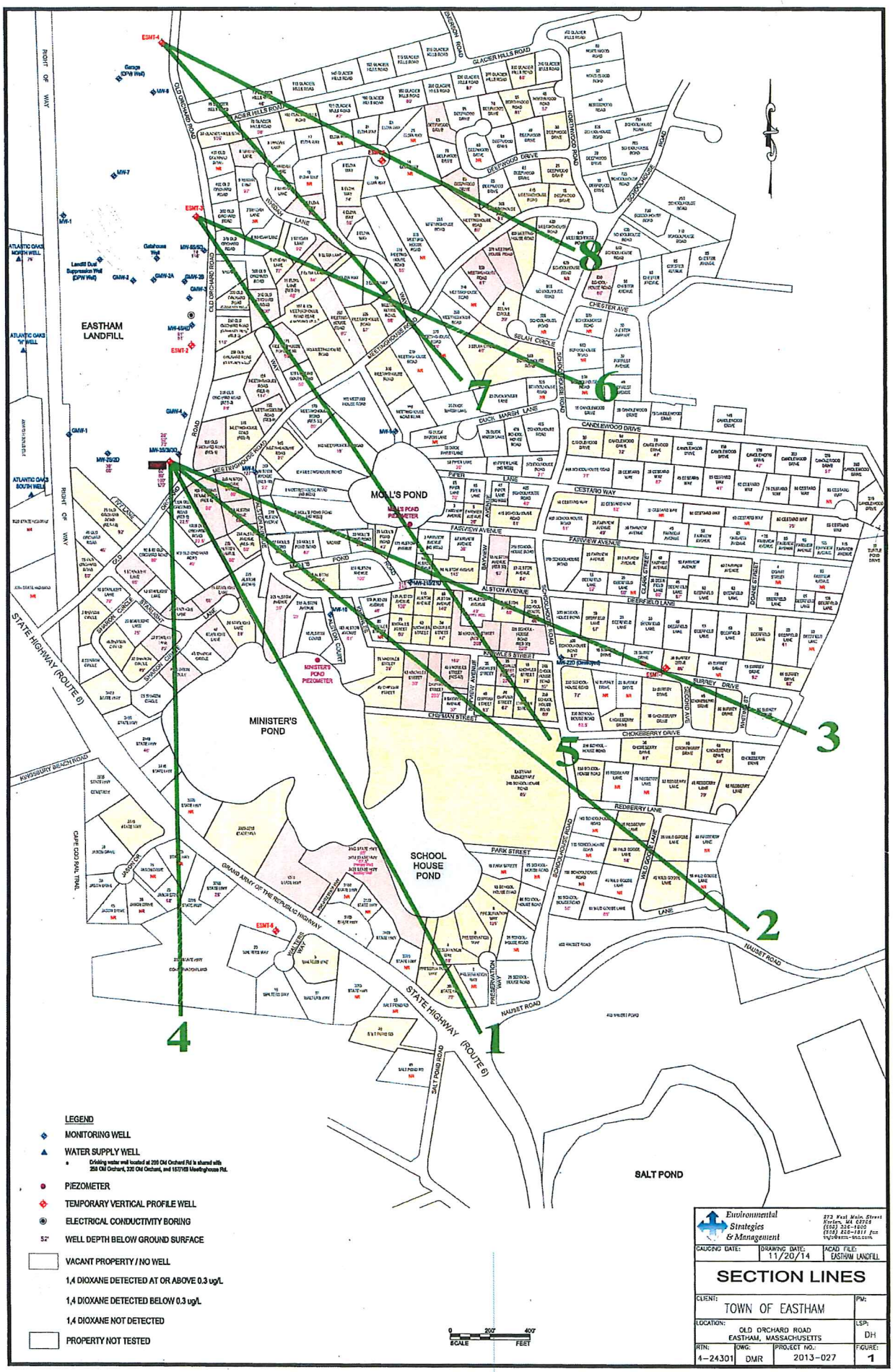
View from the Cape Cod National Seashore Salt Pond Visitor Center

Photo from Friends of the Cape Cod National Seashore Website http://www.fccns.org/gallery7.html

Other Support Documents


EASTHAM LANDFILL
MOLL'S POND
MINISTER'S POND
SCHOOL HOUSE POND
SALT POND
STATE HIGHWAY (ROUTE 6)
OLD ORCHARD ROAD
MEETINGHOUSE ROAD
GLACIER HILLS ROAD
DEERFIELD AVENUE
ALSTON AVENUE
CHAPMAN STREET
CHOKEBERRY DRIVE
REDBERRY LANE
PARK STREET
NAUSET ROAD
SALT POND ROAD
KINGSBURY BEACH ROAD
CAPE COD RAIL TRAIL
LEGEND
MONITORING WELL
WATER SUPPLY WELL
PIEZOMETER
TEMPORARY VERTICAL PROFILE WELL
ELECTRICAL CONDUCTIVITY BORING
VACANT PROPERTY / NO WELL
1,4 DIOXANE DETECTED AT OR ABOVE 0.3 ug/L
1,4 DIOXANE DETECTED BELOW 0.3 ug/L
1,4 DIOXANE NOT DETECTED
PROPERTY NOT TESTED
PIEZOMETRIC SURFACE ELEVATION
INFERRED PIEZOMETRIC SURFACE CONTOUR
APPROXIMATE GROUNDWATER FLOW DIRECTION -20' TO -40' INTERVAL
WATER TABLE ELEVATION
INFERRED WATER TABLE CONTOUR
APPROXIMATE SHALLOW GROUNDWATER FLOW DIRECTION
VERTICAL GROUNDWATER GRADIENT
APPROXIMATE EXTENT OF 1,4 DIOXANE RELEASE
SCALE
FEET
Environmental Strategies & Management
373 West Main Street Norton, MA 02766 (508) 285-1600 (508) 226-1811 fax
GAUGING DATE:
DRAWING DATE: 12/02/14
ACAD FILE: EASTHAM LANDFILL
ESTIMATED GROUNDWATER FLOW PATTERNS
VICINITY OF EASTHAM LANDFILL
CLIENT: TOWN OF EASTHAM
LOCATION: OLD ORCHARD ROAD EASTHAM, MASSACHUSETTS
PM: DH
LSP:
RTN: 4-24301
DWG: DMR
PROJECT NO.: 2013-027
FIGURE: 1


EASTHAM LANDFILL
MOLL'S POND
MINISTER'S POND
SCHOOL HOUSE POND
SALT POND
STATE HIGHWAY (ROUTE 6)
GLACIER HILLS ROAD
OLD ORCHARD ROAD
SCHOOL HOUSE ROAD
FARVIEW AVENUE
ALSTON AVENUE
CHESTER AVE
CANDLEWOOD DRIVE
CHOKEBERRY DRIVE
REDBERRY LANE
PARK STREET
KINGSBURY BEACH ROAD
NAUSET ROAD
SALT POND ROAD
GRAND ARMY OF THE REPUBLIC HIGHWAY
LEGEND
MONITORING WELL
WATER SUPPLY WELL
PIEZOMETER
TEMPORARY VERTICAL PROFILE WELL
ELECTRICAL CONDUCTIVITY BORING
WELL DEPTH BELOW GROUND SURFACE
VACANT PROPERTY / NO WELL
1,4 DIOXANE DETECTED AT OR ABOVE 0.3 ug/L
1,4 DIOXANE DETECTED BELOW 0.3 ug/L
1,4 DIOXANE NOT DETECTED
PROPERTY NOT TESTED
The color coding is based on the highest concentration of 1,4 dioxane detected in drinking water samples collected at the property.
SCALE
FEET
Environmental Strategies & Management
GAUGING DATE:
DRAWING DATE: 1/14/15
ACAD FILE: EASTHM LANDFILL
COMPREHENSIVE SITE ASSESSMENT
CLIENT: TOWN OF EASTHAM
PM:
LOCATION: OLD ORCHARD ROAD EASTHAM, MASSACHUSETTS
LSP: DH
RTN: 4-24301
DFG: DWR
PROJECT NO.: 2013-027
FIGURE: 1



Environmental Strategies & Management

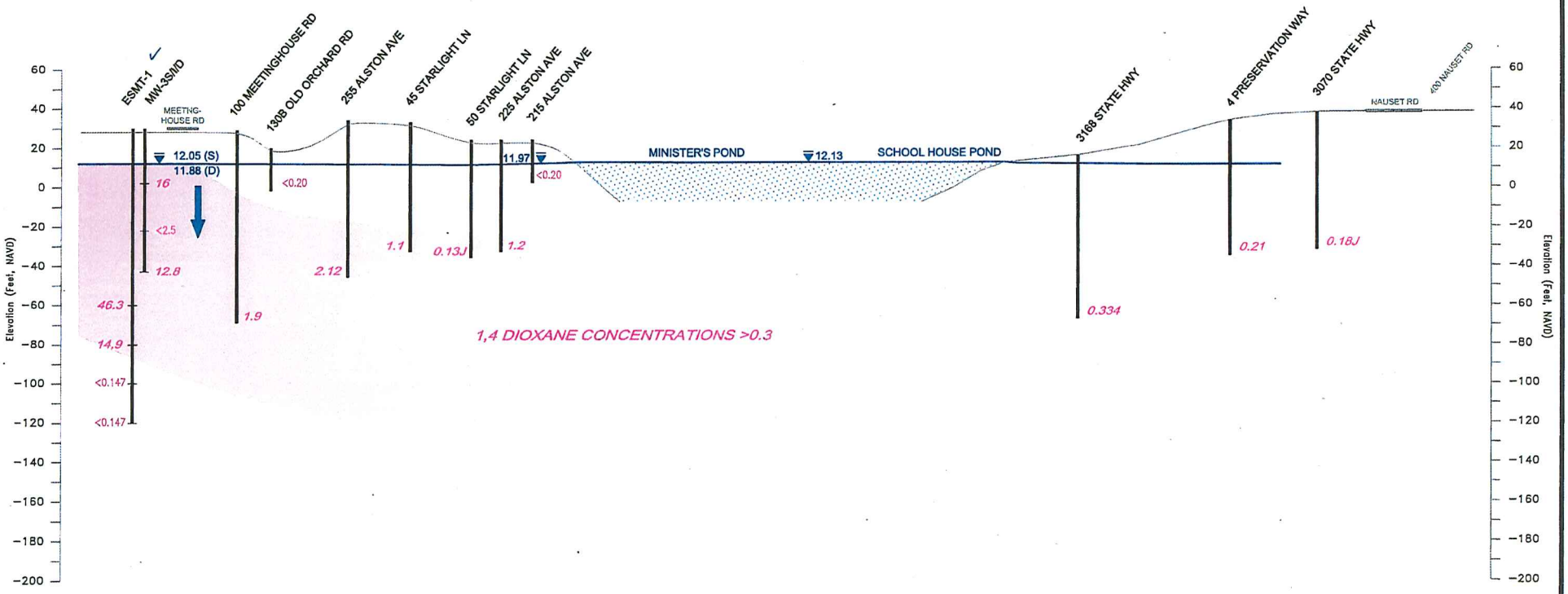
273 West Main Street
Norton, MA 02766
(508) 285-1810
(508) 285-1811 fax
info@esm.com

GAUGING DATE:	DRAWING DATE: 11/20/14	ACAD FILE: EASTHAM LANDFILL

SECTION LINES

CLIENT: TOWN OF EASTHAM			PM:
LOCATION: OLD ORCHARD ROAD EASTHAM, MASSACHUSETTS			LSP: DH
RTN: 4-24301	DWG. DMR	PROJECT NO.: 2013-027	FIGURE: 1

SECTION 1



LEGEND

APPROXIMATE WELL LOCATION AND DEPTH ON PROPERTY INDICATED

1.9 — 1,4 DIOXANE DETECTED IN ug/L

<0.20 — BELOW DETECTION LIMIT

11.97 — WATER TABLE ELEVATION GAUGED 10/30/2014

APPROXIMATE WATER TABLE

VERTICAL GROUNDWATER GRADIENT

50'

250'

Horizontal: 1"=250'
Vertical Exaggeration: 1"=50'

Environmental Strategies & Management
273 West Main Street
Norton, MA 02766
(508) 226-1800
(508) 226-1811 fax
info@esm-inc.com

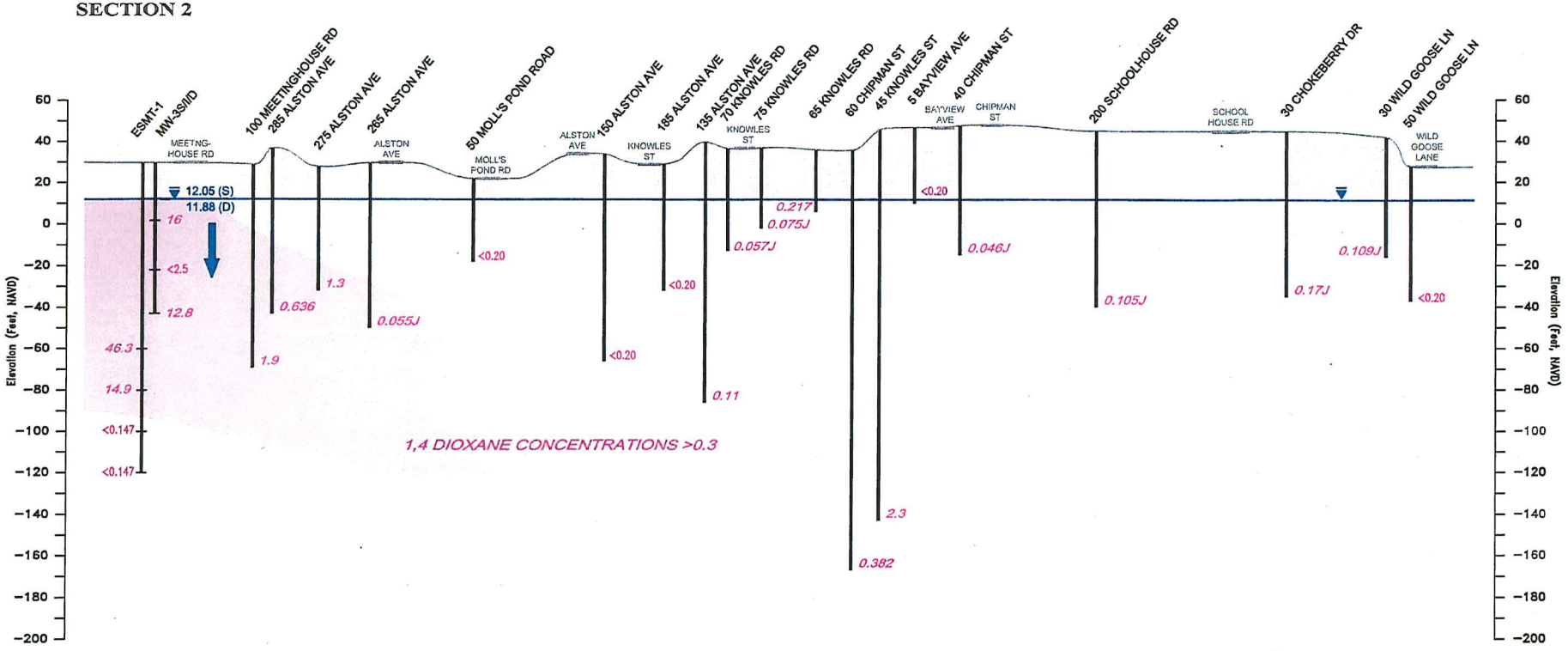
GAUGING DATE:	DRAWING DATE:	ACAD FILE:
10/30/14	12/02/14	EASTHAM LANDFILL

SECTION 1

CLIENT:	PM:
TOWN OF EASTHAM	
LOCATION: OLD ORCHARD ROAD EASTHAM, MASSACHUSETTS	LSP: DH

RTN:	DWG:	PROJECT NO.:	FIGURE:
4-24301	DMR	2013-027	1

SECTION 2



LEGEND

APPROXIMATE WELL LOCATION AND DEPTH ON PROPERTY INDICATED

1.9 — 1,4 DIOXANE DETECTED IN ug/L

<0.20 — BELOW DETECTION LIMIT

11.97 — WATER TABLE ELEVATION GAUGED 10/30/2014

APPROXIMATE WATER TABLE

VERTICAL GROUNDWATER GRADIENT

50'

250'

Horizontal: 1"=250'
Vertical Exaggeration: 1"=50'

Environmental Strategies & Management
273 West Main Street
Norton, MA 02766
(508) 226-1800
(508) 226-1811 fax
info@esm-inc.com

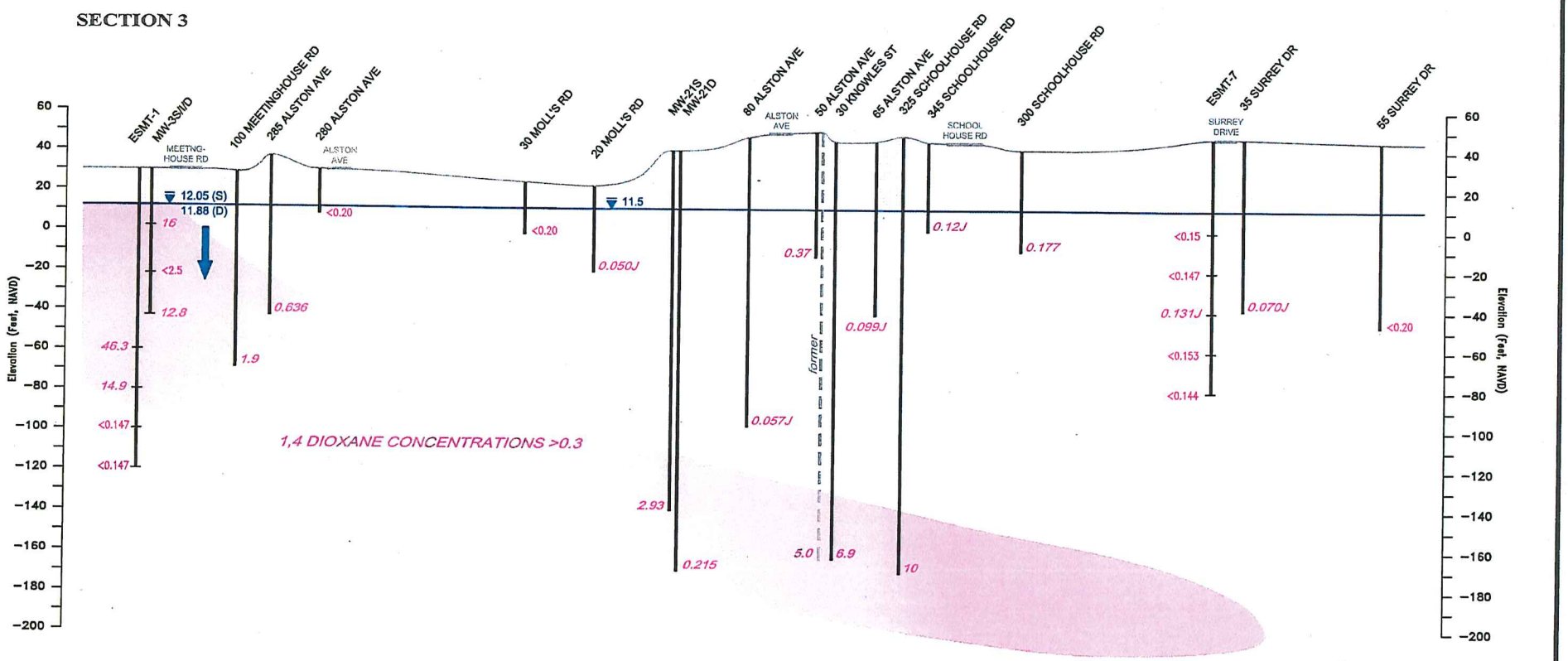
GAUGING DATE:	DRAWING DATE:	ACAD FILE:
10/30/14	11/20/14	EASTHAM LANDFILL

SECTION 2

CLIENT:	PM:
TOWN OF EASTHAM	
LOCATION: OLD ORCHARD ROAD EASTHAM, MASSACHUSETTS	LSP: DH

RTN:	DWG:	PROJECT NO.:	FIGURE:
4-24301	DMR	2013-027	1

SECTION 3



LEGEND

APPROXIMATE WELL LOCATION AND DEPTH ON PROPERTY INDICATED

1.9 1,4 DIOXANE DETECTED IN ug/L

<0.20 BELOW DETECTION LIMIT

11.97 WATER TABLE ELEVATION GAUGED 10/30/2014

APPROXIMATE WATER TABLE

VERTICAL GROUNDWATER GRADIENT

50'

250'

Horizontal: 1"=250'
Vertical Exaggeration: 1"=50'

Environmental Strategies & Management
273 West Main Street
Norton, MA 02766
(508) 226-1800
(508) 226-1811 fax
info@esm-inc.com

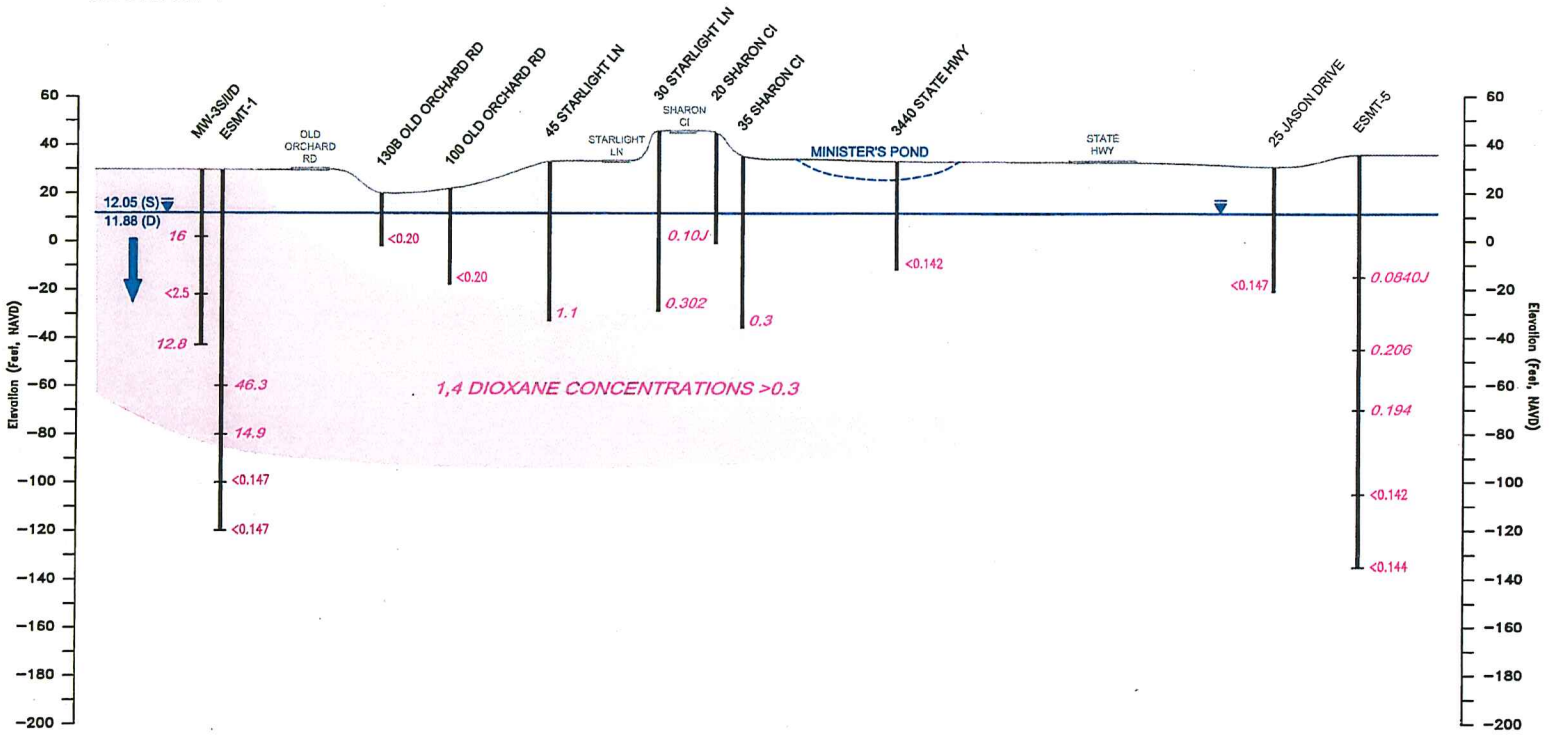
GAUGING DATE:	DRAWING DATE:	ACAD FILE:
10/30/14	11/20/14	EASTHAM LANDFILL

SECTION 3

CLIENT:	PM:
TOWN OF EASTHAM	
LOCATION: OLD ORCHARD ROAD EASTHAM, MASSACHUSETTS	LSP: DH

RTN:	DWG:	PROJECT NO.:	FIGURE:
4-24301	DMR	2013-027	1

SECTION 4



LEGEND

APPROXIMATE WELL LOCATION AND DEPTH ON PROPERTY INDICATED

1.9 — 1,4 DIOXANE DETECTED IN ug/L

<0.20 — BELOW DETECTION LIMIT

11.97 — WATER TABLE ELEVATION GAUGED 10/30/2014

APPROXIMATE WATER TABLE

VERTICAL GROUNDWATER GRADIENT

50'

250'

Horizontal: 1"=250'
Vertical Exaggeration: 1"=50'

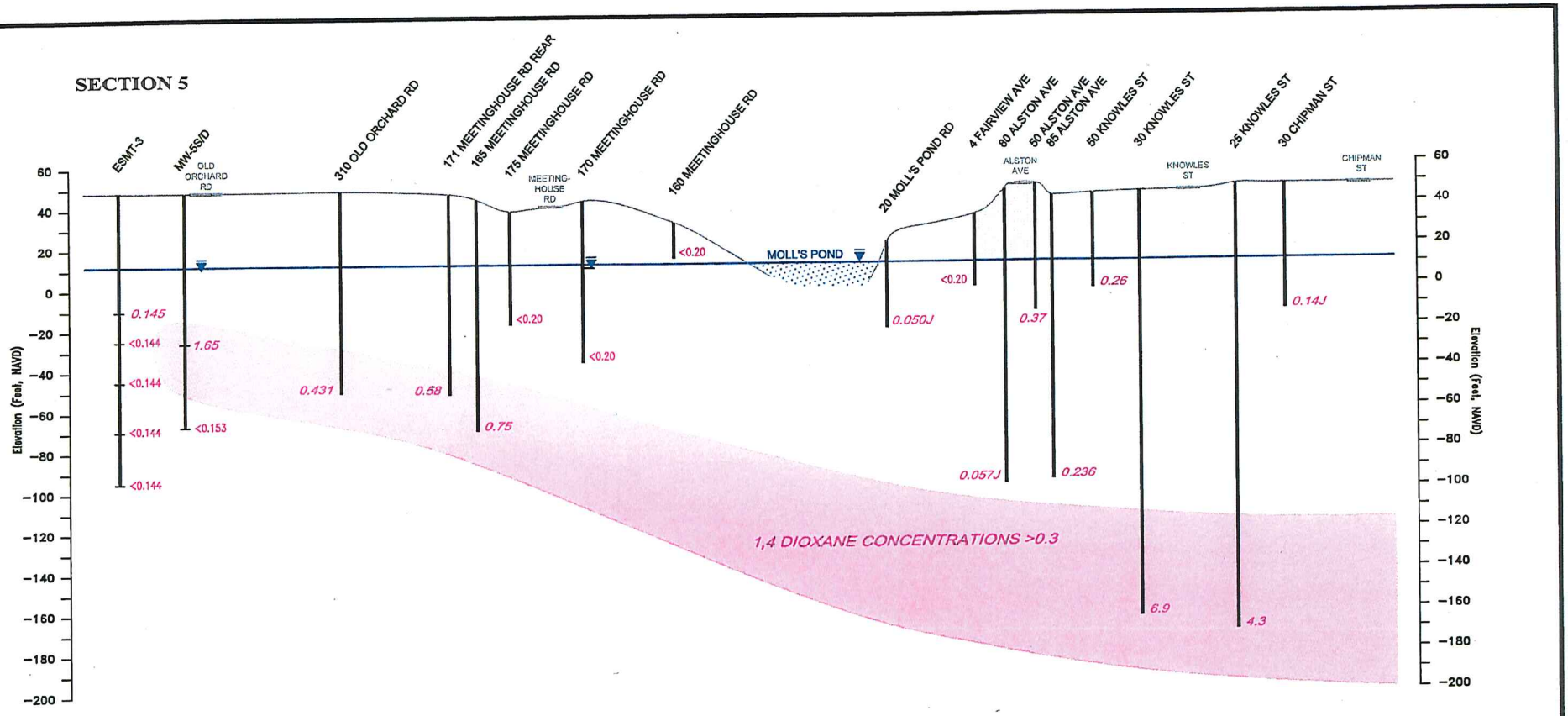
Environmental Strategies & Management
273 West Main Street
Norton, MA 02766
(508) 226-1800
(508) 226-1811 fax
info@esm-inc.com

GAUGING DATE:	DRAWING DATE:	ACAD FILE:
10/30/14	11/20/14	EASTHAM LANDFILL

SECTION 4

CLIENT:	PM:
TOWN OF EASTHAM	
LOCATION: OLD ORCHARD ROAD EASTHAM, MASSACHUSETTS	LSP: DH

RTN:	DWG:	PROJECT NO.:	FIGURE:
4-24301	DMR	2013-027	1



LEGEND

APPROXIMATE WELL LOCATION AND DEPTH ON PROPERTY INDICATED

1.9 1,4 DIOXANE DETECTED IN ug/L

<0.20 BELOW DETECTION LIMIT

APPROXIMATE WATER TABLE

50'

250'

Horizontal: 1"=250'
Vertical Exaggeration: 1"=50'

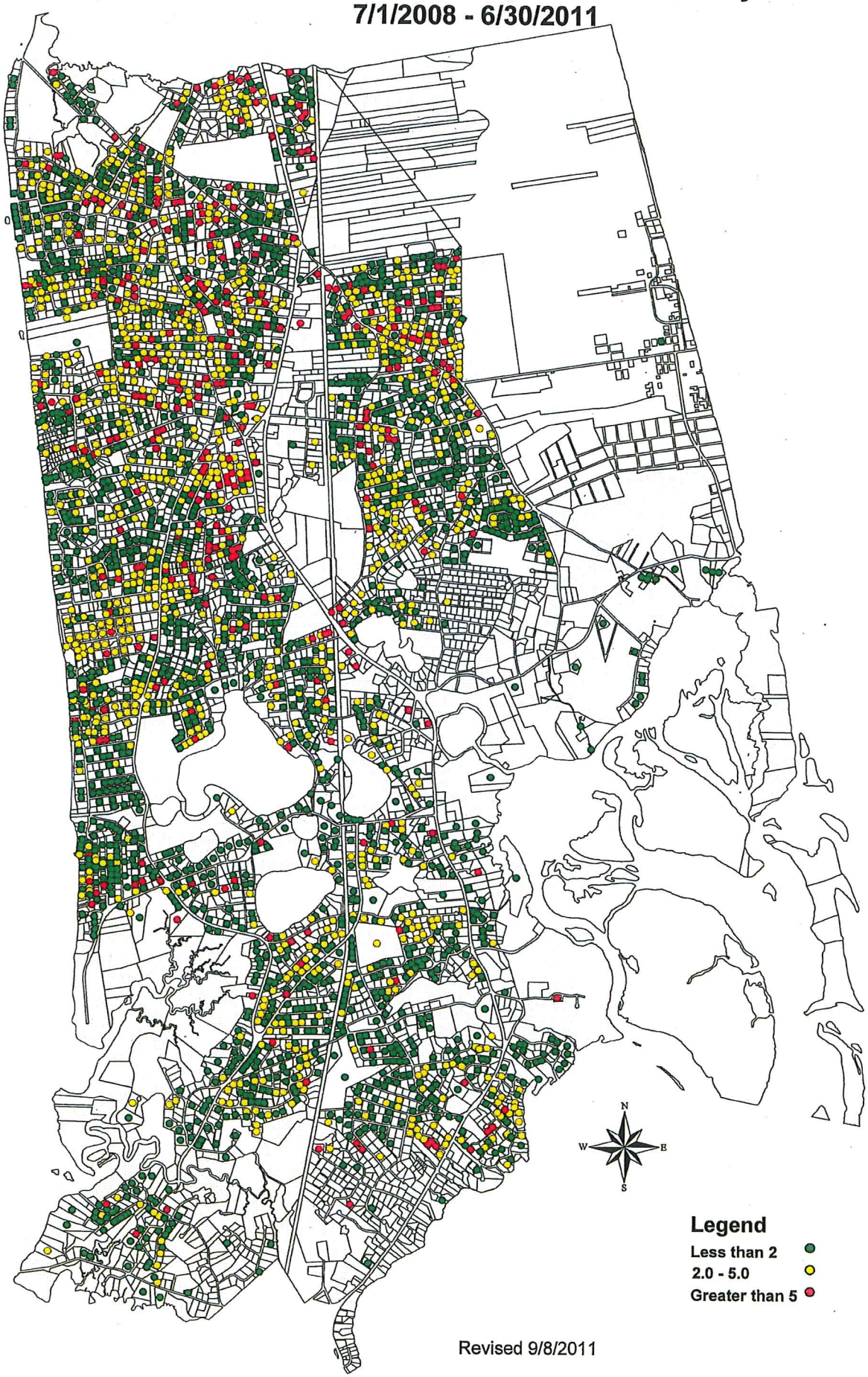
Environmental Strategies & Management
273 West Main Street
Norton, MA 02766
(508) 226-1800
(508) 226-1811 fax
info@esm-inc.com

GAUGING DATE:	DRAWING DATE:	ACAD FILE:
10/30/14	11/20/14	EASTHAM LANDFILL

SECTION 5

CLIENT:		PM:
TOWN OF EASTHAM		
LOCATION: OLD ORCHARD ROAD EASTHAM, MASSACHUSETTS		LSP: DH
RTN: 4-24301	DWG: DMR	PROJECT NO.: 2013-027
		FIGURE: 1

Eastham Water Survey Program - Nitrate Analysis
7/1/2008 - 6/30/2011



Revised 9/8/2011

Eastham Water Survey Program - Nitrate Analysis
7/1/2005 - 6/30/2008

Revised 10/29/08

Eastham Water Survey Program
Nitrate Analysis
FY 2003 - FY 2004