

## MEMORANDUM

**DATE** December 3, 2019 **JOB NO.** 2017-0021

**TO** Charles Carlson  
Orleans Dredge Advisory Committee  
[ccarlson@carlsonas.com](mailto:ccarlson@carlsonas.com)

**FROM** Leslie Fields  
[lfields@whgrp.com](mailto:lfields@whgrp.com)

**CC** John Kelly, Orleans Town Administrator; Tom Daley, DPW Director  
[jkelly@town.orleans.ma.us](mailto:jkelly@town.orleans.ma.us); [tdaley@town.orleans.ma.us](mailto:tdaley@town.orleans.ma.us)

### Pleasant Bay Dredge Permitting Update & Response to DAC Requests

The purpose of this memo is to respond to requests from the Orleans Dredge Advisory Committee (DAC) regarding the status of the Pleasant Bay Dredge Permitting project. The requests from the DAC as outlined in your email dated November 11, 2019 are listed below, along with our response.

- The DAC would like to review a written scope of work and budget for the completion of studies and permitting of dredging in these areas. Consideration should be given to whether other consultants should be solicited to bid on this work in order to expedite completion and reduce costs. The DAC is concerned that WHG may be unable to complete the necessary work promptly due to other commitments.

Response: *The original Woods Hole Group proposal for an “Engineering Study for Dredging – Fall 2016 Town Meeting Article 6”, dated March 27, 2017 is attached to this memo. A contract for the work was issued on June 5, 2017, which included Tasks 1-4 (Quanset, Narrows, Paw Wah, Arey’s and Lonnie’s Ponds), Task 5 (Mill Pond), and Task 9 (Meetings and Communication). A summary of work completed to date and remaining budget is provided as follows:*

<u>Quanset, Narrows, Paw Wah, Arey’s and Lonnie’s Ponds</u>	<u>Remaining Budget</u>
Task 1: Document Project Need & Gather Background Data	\$0
Task 2: Field Data Collection	\$1,167
Task 3: Feasibility Assessment	\$7,772
Task 4: Permitting	\$65,000
<u>Mill Pond</u>	<u>Remaining Budget</u>
Task 5:	\$6,701
<u>Meetings &amp; Communication</u>	<u>Remaining Budget</u>
Task 9: Meetings & Communication	\$7,530



*For the Pleasant Bay ponds, the scope of work required to complete the permitting is provided in the original March 27, 2017 proposal (see attached). The bulk of the remaining work is included in Tasks 3, 4, and 9. Woods Hole Group feels confident we can complete the contacted tasks, and that other consultants are not needed at this time.*

- The consultant's studies should expand to include dredging at the entrance to Meeting House Pond. The location where dredging is needed will be provided by one of the members of the DAC. No bathymetric surveys will be required. The consultant should conduct further research into when dredging may have been done in this location (e.g., during the original construction of the marina).

Response: *We are preparing a memo that outlines the current regulations that pertain to dredging at the entrance to Meeting House Pond, as well as the field investigations (i.e. bathymetric surveys) and analyses that would be needed to demonstrate that dredging is needed to restore historical navigable access. Costs for engineering services and permitting will be included in this memo. However, before completing this memo we will need the location where dredging is desired.*

- The consultant's studies should expand to include further study and permitting of dredging in the channel between the rocks at the entrance to the Mill Pond and Priscilla Landing. The DAC is aware of WHG's concern regarding the presence of red tide cysts in the Mill Pond. However, the DAC believes this issue should not be a bar to dredging as cysts are present in large quantities in other parts of the estuary, including areas where dredging is planned. A plan must be developed for addressing any concerns raised by dredging in the Mill Pond channel because dredging is both needed and desired by owners of commercial and residential boats that use the Mill Pond. A member of the DAC has petitions signed by neighborhood residents. If necessary, additional petitions can be obtained.

Response: *Task 5 of the current contract includes an evaluation of the potential impacts of dredging a channel into Mill Pond on red tide distributions. We have obtained a verbal opinion from the scientists at the Woods Hole Oceanographic Institution (WHOI) that dredging could result in spreading of red tide from Mill Pond to Roberts Cove and the surrounding areas. Based on this opinion, we chose not to proceed with the analysis described in Task 5. At this point, we recommend scheduling a time when Don Anderson from WHOI can come to a DAC meeting to discuss the potential impacts of dredging in Mill Pond on red tide distributions. Once the DAC has a more complete understanding of the potential impacts, a decision can be made whether or not to proceed with the more complete Task 5 analysis. Woods Hole Group would be happy to schedule the meeting with Don Anderson if the DAC is interested.*

- Except where there are physical obstacles to doing so, all dredging sites should contemplate dredging to a depth of 5 feet at MLW rather than the 3 feet as proposed by WHG. Further, wherever possible, the channels should have a width of 50 feet rather than 30 feet. Both actions will improve navigation and will increase water exchange in the terminal ponds.

Response: *The channel dimensions considered by Woods Hole Group were chosen to mirror the previously permitted projects in keeping with maintenance dredging, which is what the Town originally contracted Woods Hole Group to do. An increase in the width and/or depth of the channels would be considered improvement dredging. In the Pleasant Bay ACEC, improvement dredging is only allowed under the current regulations for the sole purpose of (i) fisheries or wildlife enhancement, (ii) an Ecological Restoration project, or (iii) conducted by a public entity for the sole purpose of the maintenance or restoration of historic channels consistent with the Pleasant Bay Management Plan. For the five (5) sites in Pleasant Bay, dredging is not being proposed for the sole purpose of fisheries or*



wildlife enhancement, nor would the projects qualify for Ecological Restoration projects. Since the sites have previously been permitted and channels dredged to 30 ft wide and 3 ft deep, it is not possible to argue that an increase in channel width or depth is needed to restore historic channels. The only way this improvement dredging (i.e., 50 ft wide to 5 ft MLLW) would be allowed, would be to change the state regulations.

- WHG has pointed out that a number of previously permitted dewatering and disposal sites are now unavailable and WHG has identified additional potential dewatering and disposal sites. The next phase of study should include recommendations for the location and method of dewatering and disposal at each dredging location. The consultant should identify whether the Town, members of the DAC or the consultant will be expected to approach private landowners for permission to dewater and dispose of dredged material on their property.

*Response: The assessment of potential dewatering and disposal sites for dredging in the Pleasant Bay ponds is included in Task 3 of the current contract. This Task includes evaluation of the previously permitted disposal sites as well as new sites identified during our Task 3 research. We will be working with the Orleans Conservation Commission to identify sites within Pleasant Bay that are currently permitted for beach nourishment, and we plan to reach out to the Town of Chatham for similar information. We will also identify potential offloading locations at the public and private landings, as well as upland storage locations. We would expect the Town and/or the DAC to approach private property owners and owners of the private landings to inquire about their interest in participating in the project.*

- The DAC is aware of private parties and public entities that may be interested in using dredged sand for beach nourishment and other purposes. The consultant should develop a list of these parties as part of its work, including the potential amount of sand that could be used by each party. The consultant should evaluate the method used on Martha's Vineyard for sale of dredged sand and its applicability in Orleans.

*Response: As mentioned above, Woods Hole Group will identify private and public entities currently permitted to receive beach nourishment. Fill volumes, frequencies, and any time of year restrictions will be documented. We are also familiar with the sand requirements for other municipal projects in the Town of Orleans, and will factor this into our Task 3 assessment. Woods Hole Group does not plan to compile a list of contractors or consultants that have a regular need for sand, and as such we recommend this be performed by the DAC or other body within the Town. An evaluation of the economics of implementing a system similar to the one used by the Edgartown Dredge where private property owners pay the town directly for sand pumped to their properties is beyond the scope of our current contract. However, this type of analysis is included in the scope for the Dredge Purchase Feasibility Assessment.*

- The next phase of study should identify the permits required for dredging at each location and the likely timetable for these permits.



Response: *Permits required for dredging and the likely timetable for securing the permits are summarized below. The timetable assumes submittal of the permit applications during the summer of 2020.*

<b>Permit</b>	<b>Agency</b>	<b>Permit Issuance</b>
Order of Conditions	Orleans Conservation Commission	Aug. 15, 2020
401 Water Quality Certification	MADEP Wetlands & Waterways	Nov. 15, 2020
Chapter 91 Waterways Permit	MADEP Waterways	Dec. 15, 2020
MCZM Federal Consistency Determination	MA Coastal Zone Management	Feb. 1, 2021
MA General Permit	US Army Corps of Engineers	Mar. 15, 2021

- The consultant's proposal should include a timetable for completion of each phase of the future work.

Response: *A timetable for completion of the remaining work is as follows:*

*Task 3 – Apr. 30, 2020*

*Task 4 – Jul. 1, 2020 to Oct. 1, 2020 (submittal of all permit applications)*

*Task 9 – Oct. 1, 2020*



March 27, 2017

2017-0021

Tom Daley  
Orleans Department of Public Works & Natural Resources  
139 Main Street  
Orleans, MA 02653

Sent via email: [tdaley@town.orleans.ma.us](mailto:tdaley@town.orleans.ma.us)

**Re: Proposal for Engineering Study for Dredging - Fall 2016 Town Meeting Article 6**

Dear Mr. Daley,

Woods Hole Group, Inc. is pleased to present this proposal to address the engineering study for dredging approved as Article 6 at the Town of Orleans Fall 2016 Town Meeting. As voted the purpose of the engineering study is “to obtain permits to dredge the Narrows along with the channels and rivers into the following ponds in Nauset and Pleasant Bay estuaries: Mill, Quanset, Pah Wah, Lonnie’s, Arey’s, and Meetinghouse or to take any other action relative thereto.”

In preparing this proposal Woods Hole Group has conducted preliminary research into the environmental regulations and other potential constraints specific to dredging at the seven (7) sites identified in Article 6. Based on this research we divided the project sites into three (3) distinct groups with specific recommendations on proceeding with the engineering study:

- Meetinghouse Pond
- Quanset, Narrows, Paw Way, Arey’s, and Lonnie’s Ponds
- Mill Pond

The following Scope of Services describes the work proposed for each of these areas.

**SCOPE OF WORK**

**Meetinghouse Pond**

Meetinghouse Pond is located within the Pleasant Bay Area of Critical Environmental Concern (ACEC). Because Meetinghouse Pond has not previously been dredged, and it is not identified in the Pleasant Bay Management Plan (PBMP, 2013) as an area where improvement dredging is allowed (those areas affected by shoaling from new 2007 inlet), there are only two (2) possible ways to permit dredging in this location:

- (1) Revise the PBMP to include Meetinghouse Pond as an area eligible for dredging – this would require documentation that shoaling in the entrance channel to the Pond has been exacerbated by the 2007 breach.
- (2) Demonstrate that water quality in the pond is degraded and show that dredging the channel to Meetinghouse Pond would result in water quality benefits and improvements to marine fisheries and/or wildlife habitat.

Both options described above have a low likelihood of success. As such, we do not recommend proceeding with an evaluation of the feasibility of dredging or attempting to obtain dredge permits for Meetinghouse Pond.

### **Quanset, Narrows, Paw Wah, Arey's, Lonnie's Ponds**

These areas are also located within the Pleasant Bay ACEC; however, they are identified in the PBMP (2013) as areas where maintenance dredging has occurred. As such, maintenance dredging can be allowed to continue provided that all local, state, regional and federal permitting requirements are met, and the projects are consistent with the PBMP. State Waterways (Chapter 91) regulations require that disposal of dredged materials in an ACEC be for the purposes of beach nourishment, stabilization with proper vegetative cover, or enhancement of fishery or wildlife resources (310 CMR 9.40(1)(b)). The PBMP also encourages placement of dredged materials within Pleasant Bay (according to the Waterways regulations), in order to maintain eroding shorelines.

Dredging at these sites occurred between the late 1940's through early 1960's, and the permits have since expired. The following tasks are proposed to allow future maintenance dredging.

#### **Task 1: Document Project Need & Gather Background Data**

Woods Hole Group will gather data on shoaling, pond use, and historical frequency of dredging. Shoaling will be assessed through a comparison of multiple years of bathymetric data to determine locations and volumes of shoaling. Pond use, such as numbers of boats, docks, and landings, will be documented through discussions with the Harbormaster, review of mooring permits, review of existing reports, and quantification of docks through aerial photo interpretation. Frequency of dredge activity and historic volumes of sediment removed will be evaluated through the collection and review of local dredge records (assumed to be provided by the Town of Orleans or the Pleasant Bay Alliance). As part of this task, historical permits for dredging and placement at these five ponds will also be obtained and reviewed to determine the design parameters and any conditions or constraints.

#### **Task 2: Field Data Collection**

While a significant amount of data currently exists to describe existing conditions at each of the project sites, it will be necessary to update the data using more current information. As such, the following field data will be collected in support of the projects.

- **Bathymetric Survey** – An updated hydrographic survey of the project areas will be performed to identify a design for the dredging that takes advantage of the

naturally deeper areas of the channels and minimizes the volume of material to be dredged. The surveys will be used to determine the depth of dredging needed to meet the channel design, and will also be used to estimate the volume of dredged material.

Woods Hole Group will mobilize a two-person field crew including an ACSM certified hydrographer. The crew will be equipped with a survey vessel, survey grade RTK GPS positioning system, and an Innerspace Model 455 depth sounder. Survey transects will be planned across the channels and 2-3 tie lines will be surveyed down the long axis of the channels. Data logging, realtime mapping and vessel control along survey transects will be accomplished using a tablet computer loaded with VESPOS hydrographic software. Water levels will be continuously monitored during survey operations using a VP electronic tide data recorder and will also be monitored via the RTK GPS system (as back-up data). Tide data will be referenced to the Mean Low Water Datum (MLW) and during post-processing the soundings will be corrected to this datum. The tide gauge will be leveled to the nearest USACE, NOAA, or NGS survey monument. RTK elevations will be tied to the same survey monument. Horizontal control of the data will be referenced to the Massachusetts Plane Coordinate System, North American Datum 1983 (NAD83).

- Sediment Cores – Information from sediment cores will be used to evaluate the quality and characteristics of the material required for dredging. Up to fourteen (14) sediment cores will be collected across the five (5) proposed dredge areas. The cores will be collected from a vessel outfitted with both push and vibracoring equipment. The cores will be collected down to the depth of proposed dredging plus one additional foot to account for possible overdepth dredging. Sample locations will be recorded using a RTK GPS. Core depths will be determined based on the water depth and tide elevation at the time of coring. The sediment cores will be split, described, and photographed.
- Grain Size and Chemical Analyses – The sediment cores will be sub-sampled based on the presence of vertical stratification. Cores with homogenous sediments will require only one sub-sample, while other cores with variations in sediment characteristics will require multiple samples. Up to 12 samples will be sent to the laboratory for grain size analyses. An additional 8 samples will be retained for possible chemical analyses, to be performed only if the grain size results indicate fine-grained sediment quantities > 10%. If the channel areas contain > 10% fines, the dredged materials will not be considered suitable for beach nourishment or shoreline placement, and the chemical analyses will be needed to identify potential upland placement alternatives. The chemical analyses (if required) will be conducted according to requirements in the Massachusetts 401 Water Quality regulations.
- Eelgrass Confirmatory Mapping – An eelgrass survey will be performed in the areas proposed for dredging. Prior to the survey Town staff will be consulted, and eelgrass maps from MassGIS and the Pleasant Bay Alliance will be used to plan the survey. The work will be performed by a coastal scientist experienced in

seagrass identification using a combination of underwater camera and view box. The locations of eelgrass resources will be collected using a RTK GPS. It is assumed that the Town will provide a boat and operator to assist with this survey effort.

- Shellfish Resource Investigation – Shellfish resources in the proposed dredge areas will be identified through review of existing maps, interviews with Town staff and local shellfish stakeholders, and targeted surveys. Existing maps and digital data will be obtained and used to delineate shellfish resources and aquaculture grants; species present and data sources will be noted. The maps will then be updated using data collected during targeted surveys.

### Task 3. Feasibility Assessment

Data collected during Tasks 1 and 2 will be used to develop a design for the dredged channel at each site. Where possible the channels will follow the layouts previously permitted for the 1940's to 1960's projects. However, if necessary the channel layouts will be optimized to avoid areas of fine-grained sediment and sensitive eelgrass and shellfish resources. Dredge volumes will be calculated by overlaying the channel layouts with the hydrographic data collected during Task 2.

An important part of the feasibility assessment will be to identify dredge methods and placement alternatives for the dredged material. This will be performed by identification of viable placement sites adjacent to the dredged channels that meet the requirements of the State Waterways (Chapter 91) regulations (310 CMR 9.40(1)(b)). The adjacent shorelines will be surveyed visually during Task 2 and through review of aerial photography. Proximity of potential placement sites to sensitive wetland resources such as salt marsh, rocky intertidal, eelgrass, and shellfish beds will be determined via geospatial analyses. Distances between potential placement sites and the dredged channels will be determined and used to identify suitable dredging methods (hydraulic vs. mechanical). Property ownership will also be determined, and where possible, placement sites will be located on public properties.

Also as part of Task 3 Woods Hole Group will develop information to help gauge the overall engineering and environmental feasibility for the project, as well as estimate financial resources required to construct the project. A summary report containing the findings of the feasibility assessment will be submitted to the Town and presented to the Orleans Board of Selectmen. Comments on the findings and recommendations for dredge channel design and placement alternatives will be solicited prior to proceeding with the next Task.

### Task 4. Permitting

Once the designs for the dredged channel layout and placement sites have been approved by the Town of Orleans, Woods Hole Group will prepare the engineering plans required for the various permit applications. For the purposes of this proposal it is assumed that all dredged material will be suitable for some type of shoreline placement within Pleasant Bay. This Scope of Work does not include the preparation of plans or associated permitting for dredged material placement at an upland site. In the event that such a



placement site is required it will be necessary to amend the contract to cover the additional services needed to identify and permit the upland site.

We propose to permit the five (5) dredging projects together in the form of a Comprehensive Permit. This means that one permit application covering all sites will be filed with each agency. This approach reduces the cost over permitting each project separately, and also minimizes the future management of permit documents by the Town. Table 1 summarizes the list of permits that will be required. The table details the type of application, agency responsible for issuing each permit, and the duration of the permits.

**Table 1. Required permits for the five (5) Pleasant Bay dredging projects.**

Application	Agency	Permit Duration
Environmental Notification Form	MA Environmental Policy Act	NA
Notice of Intent	Orleans Conservation Commission	3-Years, possibly up to 10-Years
401 Water Quality Certification	MADEP Wetlands & Waterways	5-Years
Chapter 91 Waterways Permit	MADEP Waterways	10-Years
MCZM Federal Consistency Determination	MA Coastal Zone Management	Not Applicable
MA General Permit	US Army Corps of Engineers	10-Years

### Mill Pond

The proposed Mill pond dredge area would develop an additional “spur” channel extending south from the Priscilla Landing spur planned for the Nauset Estuary Dredging Project. Although this area does not have the same ACEC restrictions that the Pleasant Bay Estuary sites do, Woods Hole Group is proposing an initial feasibility assessment for the Mill Pond channel due to the high red tide cyst concentrations previously identified for this area.

#### Task 5. Evaluation of Dredging Impacts on Red Tide Cyst Distributions

Woods Hole Group will team with Don Anderson and Dave Ralston from the Woods Hole Oceanographic Institution (WHOI) who have years of experience with red tide research, and specific experience in Nauset Estuary with hydrodynamic modeling of the physical and biological controls on harmful red tide blooms. The purpose of Task 6 is to use existing information on red tide cyst populations in the planned dredge channel to determine potential impacts on red tide distributions.

During this Task the number of cysts to be removed with the dredging will be estimated, and combined with predicted resuspension rates to gauge how many of the disturbed cysts from the sediment might contribute to a bloom. Based on the findings of this analysis, we will develop a memo for the Town that documents the likely impacts of dredging Mill Pond, and recommendations will be provided on whether the Town should pursue dredging in this location. If the recommendation is not to proceed, then no further action would be taken to pursue data collection, feasibility analysis or permitting for Mill Pond. If the recommendation is that dredging would have a low probability of producing an adverse impact with respect to red tide blooms, then all steps described in Tasks 2

through 5 above would be performed for Mill Pond. For the purpose of individual cost breakdowns, these tasks for Mill Pond are noted separately below and listed individually in Table 1.

Task 6. Field Data Collection – Mill Pond (optional based on outcome of Task 5)

Field data collection for the Mill Pond channel will include the following components: bathymetric survey, sediment cores, grain size and chemical analyses, red tide cyst counts, eelgrass confirmatory mapping, and shellfish resource investigation. The work will be conducted as described in Task 2 for the Pleasant Bay dredge sites, with a few exceptions. A total of 3 samples will be sent to the laboratory for grain size analyses, and up to 3 additional samples will be retained for possible chemical analyses if the sediments contain > 10% fines. Laboratory analyses will also be conducted on sediment cores to update the concentrations of red tide cyst in the dredge channel.

Task 7. Feasibility Assessment – Mill Pond (optional based on outcome of Task 5)

The feasibility assessment for the Mill Pond channel will parallel Task 3 for the Pleasant Bay dredge sites.

Task 8. Permitting – Mill Pond (optional based on outcome of Task 5)

Following completion of Tasks 6 and 7, a strategy for permitting the Mill Pond channel will be developed. Depending on the progress and timing of the Nauset Estuary dredging project, the benefits of permitting the Mill Pond channel separately or as part of the larger Nauset Estuary dredging project will be evaluated. Due to the uncertainty in permitting for the Mill Pond channel, costs for Task 8 are not included with this proposal.

Finally, to ensure transparency, open dialog, and regular input and feedback from Town officials, regulatory officials and the public, Woods Hole Group proposes a series of meetings and presentations as described in Task 9.

Task 9. Meetings and Communication

This task includes a kick-off meeting, two (2) update meetings to the Board of Selectmen following the completion of key phases of the project, a pre-application meeting with regulatory officials prior to the submittal of permit applications, and a final presentation to the Board of Selectmen at the conclusion of the project.

## ESTIMATED BUDGET

A summary of costs for Tasks 1 through 9 is provided in Table 2. Tasks 6 through 8 are contingent on a recommendation to proceed with dredging in Mill Pond following the Task 5 analysis.

**Table 2. Cost Proposal for Engineering and Environmental Permitting Services**

Task	Description	Cost
<b>Area(s): Quanset, Narrows, Paw Wah, Arey's, and Lonnie's Ponds</b>		
1	Document Project Need & Gather Background Information	\$4,180
2	Field Data Collection	\$55,170
3	Feasibility Assessment	\$12,130
4	Permitting	\$65,500
<b>Area(s): Mill Pond</b>		
5	Red Tide Cyst Evaluation	\$7,650
6	Field Data Collection (optional)	\$32,750
7	Feasibility Assessment (optional)	\$11,710
8	Permitting (optional)	TBD
<b>Area(s): All</b>		
9	Meetings and Communication	\$10,670
<b>Total (with optional Tasks)</b>		<b>\$199,760</b>
<b>Total (without optional Tasks)</b>		<b>\$155,300</b>

This proposal was assembled under the guideline for a Time & Materials "Not-To-Exceed" contract. Based on the preceding Scope of Work our services for Tasks 1 through 9 will not exceed \$199,760 without written authorization from the Town of Orleans. Our services will be invoiced based on the actual amount of time it takes to complete all contracted tasks. Materials and other direct costs will be invoiced at cost plus our standard mark up. Invoices for services rendered will be submitted monthly. Unless otherwise agreed to in writing, payment is due within 30 days following the date of our invoice. In the event of payments that are significantly or routinely late, Woods Hole Group retains the right to stop work until payment issues are redressed. In case of refusal to address payment issues, Woods Hole Group retains the right to use all appropriate legal measures to obtain rightful payment.

Woods Hole Group is prepared to initiate work on this project upon execution of a contract or notice to proceed. We anticipate that the project will be completed within eight (8) months of project initiation. We appreciate the opportunity to propose this work, and look forward to working together on this project. Please contact me at 508-495-6225 with any questions or requirements for additional information.

Sincerely,



Leslie Fields  
Coastal Geologist