

TOWN OF SUNSET BEACH
2016 SHORELINE MANAGEMENT AND PRE-DREDGE ANALYSIS
PHASE 2 - DESIGN

PROGRESS REPORT DATE
JANUARY 15, 2017

Report Period: December 01 thru November 31, 2016

The items below provide a description of key elements related to the current progress, including outstanding items and anticipated resolutions, for completing the work known as Town of Sunset Beach, 2016 Shoreline Management and Pre-Dredge Analysis, Phase 2 - Design.

Acronyms: M&N – Moffatt & Nichol
NCDEQ – North Carolina Department of Environmental Quality
NOAA – National Oceanic & Atmospheric Administration
USACE – US Army Corps of Engineers (Wilmington District)
USFWS – U.S. Fish & Wildlife Service.

Phase 1 – Feasibility Analysis (100% complete)

Items Previously Completed: (100%)

The Town of Sunset Beach (Town) and M&N initiated a contract on February 19th to study the feasibility of conducting approximately 3.5 miles of navigation dredging within the Town limits. The work areas include Mary's Creek, Turtle Creek, Jinks Creek, the North Shore Drive feeder and adjoining finger canals and the Canal Drive bay area. The results of the analysis were positive and the Town elected to move forward with the design and modeling of the proposed work on June 7th. The design work was authorized to begin July 1, 2016.

Phase 2 –Design (85.48 % complete)

Items Previously Completed (83.58 %)

1.0 Project Coordination

- The Town of Sunset Beach authorized M&N to begin the design work on July 1, 2016. The first priority was to secure a Water Resource Development Grant through the State's Shallow Draft Navigation Fund. The grant was secured on August 1 and reimburses the Town 2/3's of the project cost up to \$2,779,327.

- The Town is considering available alternatives for beneficial reuse of any dredge material. This includes beach placement for cost share potential with Ocean Isle or dune restoration adjacent to Bird Island for storm protection and habitat restoration. In addition, the dredge material may also be used for a possible living shorelines project to restore marsh or intertidal habitat for invertebrates and shorebirds. Figure 1 below shows potential sites for a marsh restoration project between Mary's and Turtle Creek and along the causeway entering the island of Sunset Beach. The potential to use the dredge spoil for a marsh restoration project option will be discussed at an agency coordination meeting expected in February / March 2017.

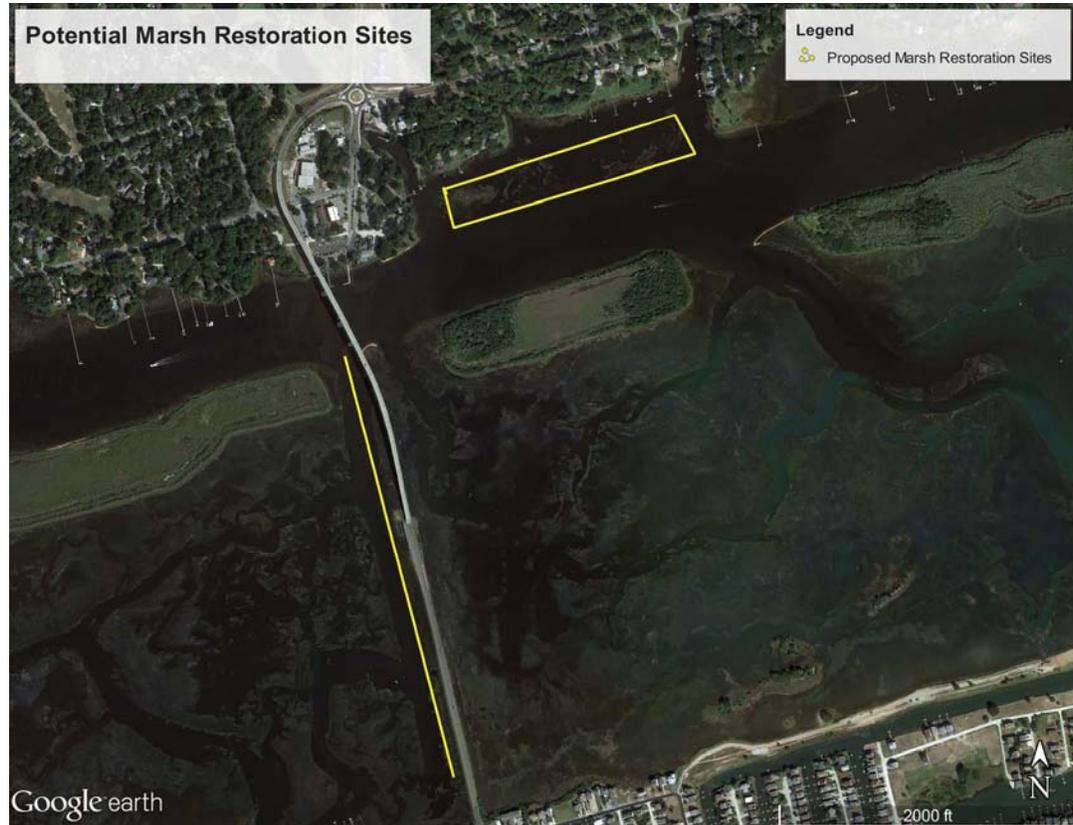


Figure 1. Proposed Marsh Restoration Sites

- The Town held a Public Meeting on Saturday, November 12th for M&N to present the channel design details to the property owners and interested parties of Sunset Beach. Information was provided regarding the dredge depth's and dimensions for each project area. The next step is to provide the same details to the permitting agencies to determine an equitable design for the project. An agency coordination meeting should occur in February to discuss the project options.

2.0 Refined Design

- M&N provided a proposed channel alignment for each work area within the project along with a dredge volume estimate on October 24th. The list below identifies the work areas and the necessary volume of material that would need to be dredged from each, based on the proposed alignments.
 - Jinks Creek: 115,000 CY
 - Bay Area: 26,000 CY
 - Feeder Channel & Finger Canals: 35,000 CY
 - Mary's Creek: 8,000 CY*
 - Turtle Creek: 8,000 CY*(The volume estimate for Mary's & Turtle Creek comes from a revised alignment provided to the Town on October 31st.)

The alignments concentrate on providing adequate navigation access for the residents of Sunset Beach while also minimizing potential impacts to environmentally sensitive lands. The alignments also focus on maintaining a 5 ~ 10 ft clearance from any existing piling or seawall. The clearance will help the Town establish a pier head alignment for future development (where applicable) and also help avoid any potential damage to the structures as a result of the construction process.

- The alignments were developed with the assistance of a modeling analysis to identify potential impacts that may occur as part of the dredging activity. The modeling analysis assumed a worst case or maximum dredge footprint of 100 ft. wide a 7 ft deep throughout Jinks Creek and evaluated the project's potential to alter the existing tidal velocities and sediment transport trends. The analysis concentrates on the trends expected near the AIWW confluence with Jinks Creek, the 'S' curve within Jinks Creek, and Tubbs Inlet. . The results indicated no significant change should occur in the tidal velocities, or sediment transport as a result of the worst case dredging scenario. A final analysis will be conducted to show the recommended alignment after the Town and residents review the proposed alternative. A modeling report will then be prepared to summarize the results for the Town and resource agencies.

3.0 Sediment Testing

- Catlin Engineers provided an initial report on the sediment analysis required to help define 'compatible' and 'non-compatible' material on October 3rd. Review of the report suggested that additional sediment samples would be necessary to complete the analysis. As a result, Catlin reinitiated efforts to collect the samples and completed the additional field work on October 26th. Based on initial review of the sediment data approximately half of the dredge material classifies as non-compatible material.

4.0 USACE Disposal Location

- M&N initiated efforts to designate a USACE material placement island along the AIWW in November 2016. Most likely the USACE, the Town, and M&N will need to conduct a site visit to identify which island provides the most economical option based on the islands current condition and the sediment volume required for placement. Based on the initial assessment 3 potential disposal islands may be suitable for the project. Figure 2 shows the designated islands as site 308, 310, & 312. The designations were provided by the USACE as a labeling system for each disposal island.

5.0 Oyster Survey

- M&N completed the field work required for the Oyster Survey of Mary's & Turtle Creek on October 19th. The initial results indicate minimum presence of oysters within the 'proposed' dredge alignments for both creeks. However, significant resources are present outside of the dredge alignment within the intertidal areas of each creek. Once the data has been reviewed a final report will be provided to the Town and resource agencies for additional discussion. The Town may be required to relocate any oyster resource identified within the dredge alignment.



Figure 2. Potential USACE Material Placement Islands

Progress this Period: (1.9 % of total task)

1.0 Project Coordination

- M&N continues to coordinate with the Town and resource agencies to gather information regarding the dredging project as well as the potential marsh restoration alternative. The information gathered will be discussed at the next Agency Coordination meeting expected in February.

2.0 Refined Design

- M&N revised the Bay Area channel template based on the quantity of non-compatible material found in the original alignment. The revised design raised the design depth 1 foot near the confluence with Jinks Creek and also reduced the allowable overdredge tolerance to 1 foot. The resulting volume proposed for removal decreased from 26,000 to 18,200 CY.

3.0 Sediment Testing

- M&N continued work on compositing the sediment data provided by Catlin Engineers to develop a final estimate on the compatible and non-compatible material available in the project. (The final analysis was provided to the Town for review on January 16th.) The table below provides a summary of the analysis results.

Dredge Area	Compatible (CY)	Non-Compatible (CY)	Total (CY)
Jinks Creek	100,982	13,246	114,228
Bay Area	645	17,555	18,200
Feeder Channel & Finger Canals	3,585	29,275	32,860
Mary's Creek	-	8,066	8,066
Turtle Creek	-	7,830	7,830

4.0 USACE Disposal Locations

- M&N continues to work towards identifying a suitable USACE material placement site for the non-compatible material involved in the project.

5.0 Oyster Survey

- Worked continued to complete the report for the oyster survey. Efforts concentrated on QA/QC reviews and methodologies to estimate the quantity of oysters that may be present in the dredge footprint, as opposed to within the respective creek (Mary's or Turtle). (The final report was provided for Town review on or about January 5th)

7.0 Conceptual Cost Estimate

- M&N continued efforts to further develop the construction cost estimate for the project. M&N has contacted multiple dredge contractors to discuss the project and to confirm construction techniques / assumptions and theoretical costs. A more definitive estimate will be provided once all of the design details have been resolved. This is not expected until after the next agency coordination meeting.

Outstanding Items and Anticipated Completion Dates:

1.0 Project Coordination

- The feasibility and permitting constraints of constructing a marsh restoration project along the island between Mary's & Turtle Creek will be discussed with the Town and the resource agencies. Based on the resulting comments, the marsh restoration project may be incorporated into the sediment management plan. Based on recent conversations with the resource agencies, the marsh restoration alternative will most likely be discussed at an independent agency coordination meeting anticipated in February or March 2017.

2.0 Refined Design

- After the Town and residents have an opportunity to review and discuss the proposed dredge alignments M&N will revise the alignments as appropriate and provide them for review by the resource agencies. The Jinks Creek modeling analysis report will also be provided for review to the Town and resource agencies. The information will be discussed at the next agency coordination meeting anticipated in February 2017.

3.0 USACE Disposal Locations

- The inspection of the USACE material confinement islands has been delayed to review the volume of non-compatible material requiring placement. Inspection of the potential placement islands will occur after review of the sediment analysis report. The inspection results are anticipated to be provided to the Town in February 2017.

4.0 Agency Coordination Meeting

- M&N will request a second Agency Coordination Meeting to present and discuss the dredge alignments, modeling results, and any potential mitigation requirements with the state and federal agencies. The meeting is anticipated to occur in late February 2017. Based in-part on the results of this meeting, the Town will determine if moving forward with the project is appropriate.

5.0 Conceptual Cost Estimate

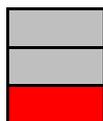
- M&N will provide an updated construction cost estimate for the proposed dredging based on the accepted design of the project. The cost estimate will be provided as the final task for the design phase and is anticipated in March 2017.

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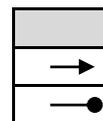
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Progress Schedule

Tasks	2016						2017												2018									
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	
Pre-Dredge Analysis Design Phase																												
Project Coordination						→																						
Public Meeting					●																							
Refined Design						→																						
Modeling Analysis						→																						
Sediment Testing						→																						
Hydrographic Survey		●																										
USACE Disposal Locations						→																						
Oyster Survey						→																						
Agency Coordination Meeting																												
Conceptual Cost Estimate					→																							



Primary Task
Anticipated timeframe to complete task.
Anticipated overrun in task.



Sub-Task
Work in progress (WIP) for task.
Actual timeframe to complete task.