

## Town of Sunset Beach

### 2016 Shoreline Management & Pre-Dredge Analysis

#### Phase 1 - Draft Scope of Work (01/20/16)

##### BACKGROUND & UNDERSTANDING

The Town of Sunset Beach (Town) intends to maintenance dredge approximately 2.8 miles of canals and feeder channels to support recreational navigation and tidal flushing. The work area includes Jinks Creek, which connects Tubbs Inlet with the Atlantic Intracoastal Waterway (AIWW), along with Mary's Creek and Turtle Creek. The work area also includes the feeder canal extending from Jinks Creek to Cobia Street and the connecting finger canals adjacent to Marlin, Sailfish, Dolphin and Cobia streets. In addition, the work area includes the canal positioned between North Shore Drive and Canal Drive, which forms the widest canal, from shoreline to shoreline, included in the work separate of Jinks Creek. Sediment shoaling induced from storm water run-off and tidal currents threaten continued navigation within these passageways. Sediment accumulation within the bay area at the confluence of Jinks Creek and Tubbs Inlet also impedes navigation traversing towards the inlet.

The proposed project would significantly improve access through the referenced waterways and establish a long-term template for maintaining the navigation depths. The project would also assist in managing the construction of future piers or docks by establishing a fixed deep water path through the canal. Once obtained, the proposed state and federal permit authorizations would provide a long standing record of the channel dimensions and alignment. The sediment removal may also improve tidal flushing and help improve nursery habitats within the tributary systems. Future pier or dock development could also maintain compliance with a Town regulated 5-foot buffer from the navigation channel with reasonable assurances deep water access will be available.

In order to provide a cost effective approach, the following scope details an initial phase for investigating the cost and feasibility of permitting the four (4) sites listed below and shown on the attached figures.

- Site 1 – Canal Street connector and finger canals adjacent to Marlin, Sailfish, Dolphin, and Cobia streets; in addition to the North Shore Drive Canal (approx. 6,800 ft)
- Site 2 – Jinks Creek (approx. 5,600 ft)
- Site 3 – Mary's Creek (approx. 1,100 ft)
- Site 4 – Turtle Creek (approx. 1,100 ft)

The scope details the work necessary to collect sufficient information to hold a coordination meeting with the environmental agencies. The meeting should identify the permitting constraints for each project area and allow for the proper estimation of the design costs required to move forward. After review of the estimated costs, the Town may elect to proceed with permitting all, any, or none of the proposed sites.

##### **Task 1.0 – Project Coordination**

Moffatt & Nichol (M&N) will provide written monthly progress reports to the Town to document the project status, current work efforts, and anticipated completion dates. M&N will also be available for conference calls at the Town's convenience to discuss the status of the project and answer any questions that may arise. Due to the short duration of the initial phase, no public meetings or presentations are envisioned for this task.

**The Proposed Lump Sum Fee for Task 1 is \$1,237.<sup>00</sup>**

### **Task 2.0 – Hydrographic Survey**

M&N will sub-contract Geodynamics LLC. to provide a hydrographic survey of the four (4) proposed sites to determine excavation quantities. The surveys will be conducted by a North Carolina licensed professional surveyor along transects spaced between 50 ft and 250 ft as shown in the attached figures. The surveys will be conducted by hydrographic techniques using a vessel mounted fathometer or other similar equipment along with kinematic GPS. Data points will be continuously collected during the hydrographic work with a maximum horizontal spacing of 10 ft. The survey will be conducted as close to high tide as possible to allow for data collection to be completed during one (1) tide cycle. The survey will not include any topographic points or ‘walking’ points and will be completely conducted by the shallow draft survey vessel.

Deliverables for this task include a survey report, a color coded GIS compatible surface of each dredge area, and a digital X,Y,Z (easting, northing, elevation) file along with a station, range, elevation (BMAP) file. The X,Y,Z file will assist with plotting the survey data in AutoCad or GIS software while the BMAP file is necessary for analysis in CEDAS (Coastal Engineering Design & Analysis System) software. The color coded surface will be generated by computer interpretation of the elevations between the collected data points and should be considered an approximation of the existing conditions. The survey data will be referenced to North Carolina State Plane NAD83 US foot horizontal coordinates and NAVD88 vertical coordinates.

**The Proposed Lump Sum Fee for Task 2.0 is \$16,897.00**

### **Task 3.0 – Develop Project Goals and Constraints**

M&N will use the hydrographic survey data collected by Geodynamics to estimate the dredge quantities for each project area. Representative cross sections will be prepared to show the typical dredge depths for the project. Color coded maps will also be generated to show the depth of excavation required in plan view for the four (4) project sites. The plan view drawings will show potential upland disposal sites that may be used for the project. The drawings and volume estimate will be provided for discussion at the agency coordination meeting discussed below.

M&N will research if any of the project area falls within a designated critical habitat area such as a Primary Nursery Area (PNA) for fisheries or critical habitat for wading shorebirds. This will include contacting representatives within the CAMA habitat section to verify the PNA boundary and restrictions believed to be in-place for Jinks Creek and the feeder canals adjacent to Canal Drive and North Shore Drive.

M&N will also work with the Town to identify potential upland disposal sites and obtain conceptual agreement for their use. This includes sites such as Bird Island, the disposal islands within the AIWW, and beach placement locations along the western end of Ocean Isle. The Town will take the lead on all communications with the site owners or management designees and M&N will provide supporting documentation and drawings to assist in explaining the request.

In addition, M&N will inquire on the potential eligibility for state cost sharing through the shallow draft navigation fund. M&N will discuss the project with NCDEQ staff to provide a conceptual outlook on the funding potential from the state.

M&N will also research the expired CAMA major permit (22-02) for Mary’s Creek and Turtle Creek to identify potential permitting issues. All of the pertinent information reviewed will be discussed at the agency coordination meeting discussed below.

**The Proposed Lump Sum Fee for Task 3.0 is \$7,079.00**

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**Task 4.0 – Agency Coordination Meeting**

M&N will request and chair an agency coordination meeting with representatives of the Town, the USACE, CAMA, and others to discuss the potential and requirements for permitting the proposed project. M&N will present the findings of Task 3.0 to the invited members a minimum of 1 week prior to the meeting to allow each member ample review of the project. A written summary of the meeting will be provided to all participants along with contact information for each attendee.

The outcome of the Agency Coordination meeting will be a determination of the level of effort required to permit and design each of the four (4) potential dredge areas. Based on the results of the coordination meeting, M&N will prepare a scope of work for the Town’s review. The scope will identify the specific tasks (including field investigations) recommended to complete the design and permitting work. The anticipated field investigations include soil borings and testing to determine the sediment characteristics along with cultural surveys and potentially hydraulic modeling.

**The Proposed Lump Sum Fee for Task 4.0 is \$4,694.00**

**The total proposed M&N fee for the work equals \$29,952.00.** M&N appreciates the opportunity to assist the Town of Sunset Beach with Phase 1 of the Shoreline Management and Pre-Dredge Analysis. To assist with the review of this scope, Table 1 below provides a breakdown of M&N man hours and costs associated with each task. (Table 2 from Geodynamics provides a summary of the costs associated with the hydrographic surveying.)

**Table 1 –M&N Estimated Costs**

| PROJECT TASK COMPLETION CHECKLIST                                   |                              |                            |                      |                     |                    |                       |                  |              |                 | Date: 21-Jan-16         |  |
|---|------------------------------|----------------------------|----------------------|---------------------|--------------------|-----------------------|------------------|--------------|-----------------|-------------------------|--|
| Firm: <u>Moffatt &amp; Nichol</u>                                   |                              |                            |                      |                     |                    |                       |                  |              |                 | Dual Number:            |  |
| Sunset Beach - Shoreline Management & Pre-Dredge Analysis           |                              |                            |                      |                     |                    |                       |                  |              |                 | Notice-to-Proceed Date: |  |
| Scoping Date:   |                              |                            |                      |                     |                    |                       |                  |              |                 |                         |  |
| TASK  | Supervisory Coastal Engineer | Senior Environ. Specialist | Coastal Engineer III | Coastal Engineer II | Coastal Engineer I | Environ. Specialist I | Senior CADD TECH | Clerical     | Totals          |                         |  |
|   |                              |                            |                      |                     |                    |                       |                  |              | Hrs.            | \$                      |  |
| Billing Rates   | 207.00                       | 185.00                     | 155.00               | 125.00              | 110.00             | 95.00                 | 110.00           | 50.00        |                 |                         |  |
| <b>Task 1 - Project Coordination</b>                                | <b>Hrs.</b>                  | <b>Hrs.</b>                | <b>Hrs.</b>          | <b>Hrs.</b>         | <b>Hrs.</b>        | <b>Hrs.</b>           | <b>Hrs.</b>      | <b>Hrs.</b>  |                 |                         |  |
| Project Coordination  | 1.00                         | -                          | 6.00                 | -                   | -                  | -                     | -                | 2.00         |                 |                         |  |
| <b>Task 1 Totals</b>  | <b>1.00</b>                  | <b>-</b>                   | <b>6.00</b>          | <b>-</b>            | <b>-</b>           | <b>-</b>              | <b>-</b>         | <b>2.00</b>  | <b>9.00</b>     | <b>\$1,237</b>          |  |
| <b>Task 2 - Hydrographic Survey</b>                                 |                              |                            |                      |                     |                    |                       |                  |              |                 |                         |  |
| Geodynamics   | -                            | -                          | -                    | -                   | -                  | -                     | -                | -            | -               | -                       |  |
| <b>Task 2 Totals</b>  | <b>-</b>                     | <b>-</b>                   | <b>-</b>             | <b>-</b>            | <b>-</b>           | <b>-</b>              | <b>-</b>         | <b>-</b>     | <b>-</b>        | <b>\$0</b>              |  |
| <b>Task 3 - Develop Project Goals &amp; Constraints</b>             |                              |                            |                      |                     |                    |                       |                  |              |                 |                         |  |
| Prepare Cross-Sections and Volume Estimate                          | 0.50                         | -                          | 2.00                 | 6.00                | 14.00              | -                     | 6.00             | -            |                 |                         |  |
| Research Critical Habitat Designations                              | -                            | 1.00                       | 1.00                 | -                   | -                  | 4.00                  | -                | -            |                 |                         |  |
| Identify Potential Disposal Sites & Obtain Conceptual Use Agreement | 0.50                         | -                          | 5.00                 | -                   | 4.00               | -                     | -                | -            |                 |                         |  |
| State Cost Share Eligibility  | 1.00                         | -                          | 2.00                 | -                   | -                  | -                     | -                | -            |                 |                         |  |
| Review Existing Information & Identify Potential Permitting Issues  | -                            | -                          | 2.00                 | -                   | 6.00               | 2.00                  | -                | -            |                 |                         |  |
| <b>Task 3 Totals</b>  | <b>2.00</b>                  | <b>1.00</b>                | <b>12.00</b>         | <b>6.00</b>         | <b>24.00</b>       | <b>6.00</b>           | <b>6.00</b>      | <b>-</b>     | <b>57.00</b>    | <b>\$7,079</b>          |  |
| <b>Task 4 - Agency Coordination Meeting</b>                         |                              |                            |                      |                     |                    |                       |                  |              |                 |                         |  |
| Prepare for Agency Coordination Meeting                             | 1.00                         | 1.00                       | 8.00                 | -                   | -                  | 2.00                  | -                | -            |                 |                         |  |
| Request & Chair Agency Coordination Meeting                         | -                            | 4.00                       | 8.00                 | -                   | -                  | -                     | -                | -            |                 |                         |  |
| Identify Scope for Moving Forward                                   | 1.00                         | 1.00                       | 2.00                 | -                   | -                  | 2.00                  | -                | -            |                 |                         |  |
| <b>Task 4 Totals</b>  | <b>2.00</b>                  | <b>6.00</b>                | <b>18.00</b>         | <b>-</b>            | <b>-</b>           | <b>4.00</b>           | <b>-</b>         | <b>-</b>     | <b>30.00</b>    | <b>\$4,694</b>          |  |
| <b>Total Man-Hours:</b>   | <b>5.00</b>                  | <b>7.00</b>                | <b>36.00</b>         | <b>6.00</b>         | <b>24.00</b>       | <b>10.00</b>          | <b>6.00</b>      | <b>2.00</b>  | <b>96.00</b>    |                         |  |
| <b>Total Personnel Expenses:</b>                                    | <b>\$1,035</b>               | <b>\$1,295</b>             | <b>\$5,580</b>       | <b>\$750</b>        | <b>\$2,640</b>     | <b>\$950</b>          | <b>\$660</b>     | <b>\$100</b> | <b>\$13,010</b> | <b>\$13,010</b>         |  |
| Miscellaneous Expenses  |                              |                            |                      |                     |                    |                       |                  |              |                 |                         |  |
| Subsistence:  |                              |                            |                      |                     |                    |                       |                  |              |                 | \$0                     |  |
| Photographs, Telephone, Shipping, Supplies, & Misc. Expenses:       |                              |                            |                      |                     |                    |                       |                  |              |                 | \$0                     |  |
| Reproduction:   |                              |                            |                      |                     |                    |                       |                  |              |                 | \$0                     |  |
| Automobile & Travel ( 1 days @ \$45/day):                           |                              |                            |                      |                     |                    |                       |                  |              |                 | \$45                    |  |
| Sediment sample analysis  |                              |                            |                      |                     |                    |                       |                  |              |                 | \$0                     |  |
| Total Miscellaneous Expenses:                                       |                              |                            |                      |                     |                    |                       |                  |              |                 | \$0                     |  |
| Total Personnel Expenses:   |                              |                            |                      |                     |                    |                       |                  |              |                 | \$0                     |  |
| <b>==&gt; Total M&amp;N Personnel &amp; Expenses: \$</b>            |                              |                            |                      |                     |                    |                       |                  |              |                 | <b>\$13,055</b>         |  |
| <b>==&gt; Total Subcontractor Expenses: \$</b>                      |                              |                            |                      |                     |                    |                       |                  |              |                 | <b>\$16,897</b>         |  |
| <b>==&gt; Total Project Fee: \$</b>                                 |                              |                            |                      |                     |                    |                       |                  |              |                 | <b>\$29,952</b>         |  |

Geodynamics  
 \$16,897

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**Table 2. Geodynamics Proposed Cost**

| SOW Item No. Task Description  |                                    | Office Admin / Review |                     | Field Support (Personnel) |             | Office Support (Labor / Hardware / Software) |                |            | Hydro Survey Support (Labor / Equip) |                         |                           | Land Survey Support | ODC's                     |                               |          | Total Task w/ Fee | % Job    | Task Total |    |
|--|------------------------------------|-----------------------|---------------------|---------------------------|-------------|--|----------------|------------|--------------------------------------|-------------------------|---------------------------|---------------------|---------------------------|-------------------------------|----------|-------------------|----------|------------|----|
|  |                                    | Sr. Project Manager   | Cert Hydro Surveyor | Hydro Survey Tech         | Survey Tech | GIS Specialist Senior                        | GIS Specialist | GIS Tech   | Hydro Crew/Vessel 18'-24'            | Singlebeam Sonar System | GPS Survey Party Class II | Mileage truck       | Mileage Truck towing boat | Per Diem (per person per day) |          |                   |          |            |    |
| <b>Project Setup / Admin</b>   |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| 1  | Project Setup                      | 1.0                   |                     |                           | 8.0         |  |                |            |                                      |                         |                           |                     |                           |                               |          | \$0.00            | \$752.31 | 4.46%      | 8% |
| 2  | Logistics                          |                       |                     |                           | 3.0         |  |                |            |                                      |                         |                           |                     |                           |                               |          | \$0.00            | \$220.51 | 1.31%      |    |
| 3  | Administration                     | 2.0                   |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          | \$0.00            | \$328.59 | 1.95%      |    |
| <b>Singlebeam Hydro Survey</b>   |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| 1  | Mobilization                       |                       |                     | 2.0                       | 2.0         |  |                |            | 3.0                                  | 3.0                     |                           |                     | 150.0                     |                               | \$102.00 | \$1,723.96        | 10.22%   | 53%        |    |
| 2  | RTN-Checkin / Calibration          |                       |                     |                           |             |  |                | 2.0        |                                      |                         |                           |                     |                           |                               | \$0.00   | \$718.81          | 4.26%    |            |    |
| 3  | Hydrographic Survey                |                       |                     |                           |             |  |                |            | 12.0                                 | 12.0                    |                           |                     |                           |                               | \$296.02 | \$4,720.06        | 27.98%   |            |    |
| 4  | Onsite Processing / QA-QC          |                       |                     |                           |             |  | 1.0            |            |                                      |                         |                           |                     |                           |                               | \$0.00   | \$105.79          | 0.63%    |            |    |
| 5  | Demobilization                     |                       |                     | 2.0                       | 2.0         |  |                |            | 3.0                                  | 3.0                     |                           |                     | 150.0                     |                               | \$102.00 | \$1,723.96        | 10.22%   |            |    |
| <b>Data Processing / GIS</b>   |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| 1  | Singlebeam Data Processing (1:1.5) |                       |                     |                           |             |  |                | 15.0       |                                      |                         |                           |                     |                           |                               | \$0.00   | \$1,201.46        | 7.65%    | 25%        |    |
| 2  | DEM Generation & GIS Compatability |                       | 1.0                 |                           |             |  |                | 16.0       | 2.0                                  |                         |                           |                     |                           |                               | \$0.00   | \$2,014.02        | 11.94%   |            |    |
| 3  | BMAP Compatability                 |                       |                     |                           |             |  |                | 4.0        |                                      |                         |                           |                     |                           |                               | \$0.00   | \$423.15          | 2.51%    |            |    |
| 4  | Final QA-QC / Metadata             |                       | 2.0                 |                           |             |  |                | 3.0        |                                      |                         |                           |                     |                           |                               | \$0.00   | \$556.77          | 3.30%    |            |    |
| <b>Final Reporting / Deliverables</b>  |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| 1  | Basic Reporting                    |                       |                     |                           |             |  |                | 4.0        | 16.0                                 |                         |                           |                     |                           |                               | \$0.00   | \$1,800.70        | 10.67%   | 14%        |    |
| 2  | Final Deliverables / Backup        |                       | 1.0                 |                           |             |  |                | 4.0        |                                      |                         |                           |                     |                           |                               | \$0.00   | \$493.63          | 2.93%    |            |    |
| <b>Total Hours/Miles:</b>  |                                    | 3.0                   | 4.0                 | 4.0                       | 15.0        | 0.0  | 25.0           | 42.0       | 18.0                                 | 18.0                    | 3.0                       | 50.0                | 300.0                     | --                            |          | \$16,874.61       | 100.00%  |            |    |
| <b>Total Costs:</b>  |                                    | \$448.08              | \$542.68            | \$371.32                  | \$1,002.30  | \$0.00                                       | \$2,404.25     | \$3,287.34 | \$5,631.12                           | \$362.52                | \$468.42                  | \$28.50             | \$294.00                  | \$500.02                      |          |                   |          |            |    |
| <b>Sub Total :</b>   |                                    | \$15,340.55           |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| <b>FedEx Delivery of Final Data:</b>   |                                    | \$20.00               |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| <b>Profit @ 10%:</b>   |                                    | \$1,536.06            |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| <b>Project Total:</b>  |                                    | \$16,896.61           |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| <b>Notes / Assumptions:</b>  |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| * Assumes use of NCGS RTN station NCSL Shallotte   |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| * All attempts made to get bank to bank coverage at high tide w/ understanding that there is likely areas that will not be passable with hydro |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| * No topographic tie in budgeted   |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| * Will need to pick a survey window with high tide in middle of the day  |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |
| * Safety of the field crew is the priority   |                                    |                       |                     |                           |             |  |                |            |                                      |                         |                           |                     |                           |                               |          |                   |          |            |    |

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Figure 1 – Canal Street and North Shore Drive Feeder Canal Survey Layout

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Figure 2 – Jinks Creek Survey Layout

