



Aptim Environmental & Infrastructure, Inc.
6401 Congress Avenue, Suite 140
Boca Raton, FL 33487
Tel: +1 561 391 8102
Fax: +1 561 391 9116
www.aptim.com

February 9, 2022

Eric Charest
Natural Resources Manager
Indian River County Public Works Coastal Division
1801 27th Street, Vero Beach, FL 32960

**Subject: Indian River County, FL
Sector 3 – 2018006 – Work Order #13
2022 Post-Construction Environmental Monitoring**

Dear Eric:

This proposal outlines a scope of work for Aptim Environmental & Infrastructure, LLC (APTIM), to provide professional services to Indian River County (the County) in support of the Sector 3 Beach and Dune Renourishment Project. The scope of work described herein is to support the County with the following items:

1. Phase 1 – Year 1 Post-Construction Environmental Monitoring (R-20 to R-40)
 - 1A. Nearshore Hardbottom Biological Monitoring
 - 1B. Sea Turtle Monitoring
2. Phase 2 – Immediate Post-Construction Environmental Monitoring (R-40 to R-55)
 - 2A. Nearshore Hardbottom Biological Monitoring
 - 2B. Sea Turtle and Shorebird Monitoring

The tasks to perform this work are listed below and described on the following pages. A breakdown of the hours and expenses to develop the cost is attached. The scope and fee were developed following the provisions of the Professional Services Agreement between the County and APTIM, dated January 9, 2018, to provide engineering and biological support services for the Sector 3 (Wabasso Beach) Beach and Dune Renourishment Project (RFQ#2018006).

1. Task 1: Phase 1 – Year 1 Post-Construction Environmental Monitoring (R-20 to R-40)
1A. Nearshore Hardbottom Biological Monitoring

The Sector 3 2022 nearshore hardbottom biological monitoring will be managed and conducted by APTIM, and conducted by APTIM's approved subconsultant, Coastal Protection Engineering LLC (CPE).

The Biological Monitoring Plan developed for the Sector 3 project during permitting requires pre- and post-construction biological monitoring adjacent to the project area to monitor for potential secondary impacts to nearshore natural hardbottom. The scope for this task is based on the Florida Department of Environmental Protection (FDEP)-approved Biological Monitoring Plan (0285993-009-JC). The nearshore hardbottom monitoring for this task shall include:

- Hardbottom edge mapping (R-19.5 to R-40)
- Monitoring permanent transects (R-20 to R-40)

Task 1A: Scope of Work

1) Hardbottom Edge Mapping:

APTIM shall map the position of the nearshore hardbottom edge for the Phase 1 Sector 3 project area, including 1000 feet north (updrift), from R-19.5 to R-40, for a length of approximately 3.8 miles. A buoy with a Differential Global Positioning System (DGPS) antenna linked to a topside laptop computer running HYPACK navigational software will be towed by divers to record the position of the nearshore hardbottom edge. The divers will follow the inshore contour of the most prominent hardbottom-sand interface. The purpose of the survey is to provide a comparison for pre- and all subsequent post-construction edge delineations.

2) Monitoring Permanent Transects:

Thirty (38) permanent transects were established along the length of project influence, which includes 1000 feet north (updrift) and 2000 feet south (downdrift). This includes twenty-four (24) biological monitoring transects and fourteen (14) sediment-only transects. Phase 1 monitoring shall be conducted from R-20 to R-40 and will include twenty-two (22) permanent transects (15 biological and 7 sediment-only). All transects were established perpendicular to the shoreline and extend from the landward hardbottom edge to a maximum distance of 50 meters seaward.

APTIM will conduct the biological survey of the hardbottom using the following methods:

- 1) Quadrat Assessments: Up to nine (9) 0.5-m² quadrats sampled along each transect to quantify the benthic community.
- 2) Sediment Measurements: Collected using line-intercept and 1-m interval sediment depth measurements.
- 3) Video/Photo Documentation: Collected for the length of each transect.

It is anticipated that the effort to delineate the hardbottom edge and monitor the transects will take up to twelve (12) field days based on previous monitoring events.

The data will be compiled and incorporated into a GIS database and in situ data will be entered into an Access database. Time to complete data entry, reduction, analyses, and report production is included in the cost estimate to address the data management and reporting requirements for those 12 days of field operations.

Task 1A: Deliverable

Raw data will be provided to FDEP and the County including a PDF of the scanned datasheets, excel spreadsheets with quadrat data, interval sediment depth measurements and line-intercept data, shapefiles of the hardbottom edge survey, video/photo documentation. Additionally, APTIM will provide a map of the project area and adjacent hardbottom resources with the hardbottom edge delineation and monitoring transects overlaid onto the most recent aerial photography (in digital format).

A post-construction biological monitoring report will be generated for submittal to the County and regulatory agencies.

Task 1A: Schedule

The Year 1 Post-Construction monitoring event will take place during summer 2022. Raw data from field operations will be submitted to the County and FDEP within 45 days and the monitoring report will be submitted within 90 days of completion of the survey.

Task 1A: Cost

The lump sum cost for this task is \$110,020.97.

1B. Sea Turtle Monitoring

The Sector 3 2022 sea turtle monitoring will be managed and coordinated by APTIM, and conducted by APTIM's approved subconsultant, Ecological Associates, Inc. (EAI).

Task 1B: Scope of Work

APTIM will oversee the scope of work proposed by EAI and provide the necessary administrative coordination to the County. The 2022 sea turtle monitoring effort along the approximate 3.7 mile shoreline (R-20 to R-40) within the Sector 3 Project Area addresses permit-required post-construction sea turtle monitoring. The monitoring will comply with all applicable conditions set forth in the regulatory permits and related authorizations for the project. EAI has provided the enclosed proposal and cost breakdown for sea turtle monitoring tasks, which are summarized as follows:

1. Mobilization
2. Project Management
3. Daily Sea Turtle Monitoring and Data Management
4. Nest Marking and Monitoring
5. Post-Construction Escarpment Surveys
6. Lighting Surveys
7. Reporting

Task 1B: Deliverable

EAI will submit a nesting season summary report within 90 days of completion of all monitoring activities. Additionally, an Excel spreadsheet summarizing all nesting activity and reproductive success will be prepared and submitted electronically to Joint Coastal Permit (JCP) Compliance and Florida Fish and Wildlife Conservation Commission (FWC).

Task 1B: Schedule

The sea turtle monitoring will commence in March 2022.

Task 1B: Cost

The lump sum cost for this task is \$116,527.05.

2. Task 2: Phase 2 – Immediate Post-Construction Environmental Monitoring (R-40 to R-55)

2A. Nearshore Hardbottom Biological Monitoring

The Sector 3 2022 nearshore hardbottom biological monitoring will be managed and conducted by APTIM, and conducted by APTIM's approved subconsultant, Coastal Protection Engineering LLC (CPE).

The nearshore hardbottom monitoring for this task shall include:

- Hardbottom edge mapping (R-40 to R-57)
- Monitoring permanent transects (R-40 to R-56)

Task 2A: Scope of Work

3) Hardbottom Edge Mapping:

APTIM shall map the position of the nearshore hardbottom edge for the Phase 2 Sector 3 project area, from R-40 to R-57, including 2000 feet south (downdrift) of the project area, for a length of approximately 3.2 miles. The same methods described above in Task 1A will be conducted.

4) Monitoring Permanent Transects:

Phase 2 monitoring shall be conducted from R-40 to R-56 and will include sixteen (16) permanent transects (9 biological and 7 sediment-only). The same methods described above in Task 1A will be conducted.

It is anticipated that the effort to delineate the hardbottom edge and monitor the transects will take up to eight (8) field days based on previous monitoring events.

The data will be compiled and incorporated into a GIS database and in situ data will be entered into an Access database. Time to complete data entry, reduction, analyses, and report production is included in the cost estimate to address the data management and reporting requirements for those 8 days of field operations.

Task 2A: Deliverable

Deliverables will be prepared as described above in Task 1A and will be submitted concurrently with Task 1A deliverables.

Task 2A: Schedule

The Immediate Post-Construction monitoring event will take place during summer 2022 concurrently with the Year 1 Post-Construction monitoring event. Raw data from field operations will be submitted to the County and FDEP within 45 days and the monitoring report will be submitted within 90 days of completion of the survey.

Task 2A: Cost

The lump sum cost for this task is \$70,308.55.

2B. Sea Turtle and Shorebird Monitoring

The Sector 3 2022 sea turtle and shorebird monitoring will be managed and coordinated by APTIM, and conducted by APTIM's approved subconsultant, EAI.

Task 2B: Scope of Work

APTIM will oversee the scope of work proposed by EAI and provide the necessary administrative coordination to the County. The 2022 sea turtle and shorebird monitoring effort along the approximate 2.95 mile shoreline

(R-40 to R-55) within the Sector 3 Project Area addresses permit-required post-construction sea turtle and shorebird monitoring. The monitoring will comply with all applicable conditions set forth in the regulatory permits and related authorizations for the project. EAI has provided the enclosed proposal and cost breakdown for sea turtle and shorebird monitoring tasks, which are summarized as follows:

1. Mobilization
2. Project Management
3. Daily Sea Turtle Monitoring and Data Management
4. Nest Marking and Monitoring
5. Nesting Shorebird Monitoring
6. Post-Construction Escarpment Surveys
7. Lighting Surveys
8. Reporting

Task 2B: Deliverable

EAI will submit a nesting season summary report within 90 days of completion of all monitoring activities. Additionally, an Excel spreadsheet summarizing all nesting activity and reproductive success will be prepared and submitted electronically to JCP Compliance and FWC.

Task 2B: Schedule

The sea turtle monitoring will commence in February 2022.

Task 2B: Cost

The lump sum cost for this task is \$119,825.10.

Summary

The total lump sum cost to perform the proposed work described herein for Sector 3 – 2018006 – Work Order #13 is \$416,681.66. The following page includes a summary of the costs and labor hours of each Task. Thank you for the opportunity to serve Indian River County. As always, please do not hesitate to call if you have any questions.

Sincerely,



Katy Brown
Lead Marine Biologist
Aptim Environmental & Infrastructure, LLC

cc: Nicole S. Sharp, P.E., APTIM
Thomas Pierro, P.E., D.CE, CPE
Stacy Buck, CPE
Debra Neese, APTIM



Authorized Corporate Signature

Nicole S. Sharp P.E.

Printed Name

Coastal Restoration & Modeling Program Manager

Title

Indian River County, Florida
Sector 3 - 2018006 - Work Order #13
2022 Nearshore Hardbottom Biological Monitoring and Sea Turtle Monitoring

Summary of Cost by Task

Task Number	Task Name	Labor	Equipment	Materials	Mobilization	Subcontractors	Total
Task 1A	Phase 1 (Yr 1 Post) Nearshore Hardbottom Biological Monitoring	\$ 56,836.00	\$21,122.25	\$ 1,980.00	\$ 5,357.00	\$ 24,725.72	\$ 110,020.97
Task 1B	Phase 1 (Yr 1 Post) Sea Turtle & Shorebird Monitoring	\$ 1,140.00				\$ 115,387.05	\$ 116,527.05
Task 2A	Phase 2 (I-Post) Nearshore Hardbottom Biological Monitoring	\$ 36,036.00	\$14,041.95	\$ 1,380.00	\$ 3,653.00	\$ 15,197.60	\$ 70,308.55
Task 2B	Phase 2 (I-Post) Sea Turtle & Shorebird Monitoring	\$ 1,140.00				\$ 118,685.10	\$ 119,825.10
Totals =		\$ 95,152.00	\$35,164.20	\$ 3,360.00	\$ 9,010.00	\$ 273,995.47	\$ 416,681.67

Indian River County, Florida
Sector 3 - 2018006 - Work Order #13
2022 Nearshore Hardbottom Biological Monitoring and Sea Turtle Monitoring

Summary of Labor Hours and Cost

Labor Title	Labor Bill Rate	Phase 1 (Yr 1 Post) Nearshore HB Monitoring		Phase 1 (Yr 1 Post) Sea Turtle & Shorebird Monitoring		Phase 2 (I-Post) Nearshore HB Monitoring		Phase 2 (I-Post) Sea Turtle & Shorebird Monitoring		Totals	
		Task 1A		Task 1B		Task 2A		Task 2B		Labor Hours	Cost
		Labor Hours	Cost	Labor Hours	Cost	Labor Hours	Cost	Labor Hours	Cost		
Principal Engineer/Sr Proj Mngr	\$250.00	1	\$ 250.00			1	\$ 250.00		\$ -	2	\$ 500.00
Sr Coastal Engineer/Proj Mngr	\$165.00	20	\$ 3,300.00	2	\$ 330.00	4	\$ 660.00	2	\$ 330.00	28	\$ 4,620.00
Senior Marine Biologist	\$135.00	18	\$ 2,430.00	6	\$ 810.00	2	\$ 270.00	6	\$ 810.00	32	\$ 4,320.00
Marine Biologist II	\$ 95.00	401	\$ 38,095.00			273	\$ 25,935.00		\$ -	674	\$ 64,030.00
Senior CAD Operator	\$140.00	1	\$ 140.00			1	\$ 140.00		\$ -	2	\$ 280.00
GIS Operator	\$105.00	6	\$ 630.00			6	\$ 630.00		\$ -	12	\$ 1,260.00
Boat Captain	\$ 80.00	148	\$ 11,840.00			100	\$ 8,000.00		\$ -	248	\$ 19,840.00
Bookkeeper	\$ 80.00	1	\$ 80.00			1	\$ 80.00		\$ -	2	\$ 160.00
Clerical	\$ 71.00	1	\$ 71.00			1	\$ 71.00		\$ -	2	\$ 142.00
Subcontractors	-	-	\$ 24,725.72		\$ 115,387.05		\$ 15,197.60		\$ 118,685.10	-	\$ 273,995.47
Equipment	-	-	\$ 21,122.25				\$ 14,041.95		\$ -	-	\$ 35,164.20
Materials	-	-	\$ 1,980.00				\$ 1,380.00		\$ -	-	\$ 3,360.00
Mobilization/Other ODCs	-	-	\$ 5,357.00				\$ 3,653.00		\$ -	-	\$ 9,010.00
TOTAL	-	597	\$ 110,020.97		\$ 116,527.05		\$ 70,308.55	8	\$ 119,825.10	605	\$ 416,681.67



Ms. Nicole Sharp
APTIM
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431

February 7, 2022

Dear Ms. Sharp:

Ecological Associates, Inc. (EAI) is pleased to submit its Scope of Work and Cost Proposal for providing professional environmental services in support of Indian River County's Sector 3 Beach and Dune Nourishment Project. This proposal addresses post-construction sea turtle permit-compliance monitoring along approximately 3.7 miles of beach (Phase 1) during the 2022 nesting season, along with an appropriate reference beach, as described in the Scope of Work presented below. This monitoring will comply with all applicable conditions set forth in the regulatory permits and related authorizations issued for the project.

SCOPE OF WORK

This scope of work was developed based on conditions and requirements set forth in standard regulatory permits and the following documents:

- Florida Department of Environmental Protection (FDEP) Joint Coastal Permit (JCP) No. 0285993-009-JC
- U.S. Fish and Wildlife Service (USFWS) Revised Statewide Programmatic Biological Opinion (BO) dated March 13, 2015

Task 1: Mobilization

All equipment, staff, and schedules will be prepared prior to project commencement. The Phase 1 Project Area extends approximately 3.7 miles from FDEP Range Monument R-20 to R-40. The Reference Area, approximately 3.8 miles south of the Project and outside of the influence of any fill placement activities, lies between R-60 and R-68. Pre-existing survey zone boundaries, consistent with those established by Indian River County under its Habitat Conservation Plan, will be verified and re-marked, and project-specific data sheets and a database will be created.

Task 2: Project Management

An EAI project manager will oversee all fieldwork and data management operations, participate in weekly check-in meetings with APTIM/Indian River County, and consult with APTIM on permit requirements, as necessary. A project schedule, as well as field survey schedules, will be created and maintained throughout the life of the project. All equipment and supplies necessary to successfully implement this Scope of Work are available.

Task 3: Daily Sea Turtle Monitoring and Data Management (FDEP Specific Condition 15)

Beginning on March 1, 2022, EAI will conduct daily morning sea turtle nesting surveys of the Project and Reference Areas. Surveys will continue through November 11, 2022 or until two (2) weeks without a crawl in the Project Area, whichever is earlier. If there is a two-week period where no crawls are documented in the Project Area, EAI will request a waiver from the USFWS and FWC to discontinue daily monitoring. If permission is granted, EAI will then perform surveys three days per week to monitor marked nests.

Surveys will commence within 30 minutes of sunrise. Monitoring will be performed by EAI staff either on foot or using ATVs. All emergences (turtle crawls) apparent from the previous night will be interpreted to determine which species of turtle came ashore and whether or not it nested. Crawls will be denoted as being above or below the previous high tide line. The approximate geographic location of each crawl will be determined by GPS (sub-meter accuracy). In addition to segregating crawls into nesting and non-nesting emergences (false crawls), each false crawl will be assigned to one of the following categories denoting the stage at which the nesting attempt was abandoned: no digging, abandoned body pit, or abandoned egg cavity. Any obstacles encountered by turtles during their crawls will be documented.

Disorientation Reporting. During the course of daily monitoring, any evidence of hatchling misorientation or disorientation from either marked or unmarked nests will be documented using FWC's electronic Marine Turtle Hatchling Disorientation Incident Report Form. Based on track evaluations, an estimate of the number of hatchlings disoriented will be recorded and light sources potentially responsible for the disorientation identified. Information concerning each incident will be forwarded by email to Indian River County on a weekly basis so appropriate remedial action may be taken.

Stranding and Salvage. A requirement of FWC sea turtle permit holders conducting nesting surveys is to respond to the stranding of sick, injured, and dead sea turtles within their survey area. These animals are examined, and if alive, transported to state-approved care facilities. A standard Sea Turtle Stranding and Salvage data form will be completed and submitted for each stranded animal encountered by EAI. This information will be transmitted to FWC in accordance with established guidelines.

State and Federal Authorizations. All sea turtle monitoring and related activities will be performed under FWC Marine Turtle Permit #261 issued by FWC to EAI Director of Operations, Niki Desjardin. All persons engaged in monitoring performed by EAI for the Sector 3 Beach and Dune Nourishment Project will be listed on the permit.

All data will be subject to rigorous QA/QC protocols and stored in EAI's project-specific database. Monthly summary reports will be furnished to APTIM. These reports will tabulate the dates and times of monitoring, names of monitoring personnel, numbers of sea turtle emergences by species, and numbers of nests marked and evaluated for reproductive success, as applicable. Monthly reports will be submitted to APTIM on the last day of the month following delivery of services (e.g., March report due no later than April 30), or as otherwise mutually agreed upon. *Daily sea turtle monitoring will be charged at a daily rate. *Monthly summary reports on sea turtle nesting and predation will also be sent to the Archie Carr National Wildlife Refuge to assist management efforts.*

Task 4: Nest Marking and Monitoring (FDEP Specific Condition 15)

A representative sample of nests in the Project and Reference Areas will be marked for determination of nest fate and reproductive success (not to exceed 150 nests total). Nests will be marked using a series of stakes and surveyor's tape. These nests will be monitored throughout their incubation period to determine nest fate (e.g., hatched, washed out, depredated, vandalized, etc.). After an appropriate incubation period, and in accordance with the FWC Handbook, nests will be excavated to determine reproductive success. Two measures of reproductive success will be calculated: hatching success (the percentage of eggs in the nest that hatch) and emerging success (the percentage of eggs in the nest that produce hatchlings which successfully escape from the nest).

Tasks 5a-5b: Post-Construction Escarpment Surveys (FDEP Specific Condition 18)

A pre-season escarpment (scarp) survey will be conducted within the Sector 3 Phase 1 Project Area two weeks prior to sea turtle nesting season. The length, average height category, and approximate maximum height (as described below) will be recorded for all scarps that may impede turtles from reaching suitable nesting habitat. A summary report will be provided to APTIM so that actions may be taken to remove the scarps prior to nesting season, if necessary. *The pre-season scarp survey will be charged only if the survey is necessary.*

Beginning on March 1, 2022, scarp surveys will be conducted on a weekly basis within the Sector 3 Phase 1 Project Area through October 31, 2022. In accordance with FWC protocol, scarps are functionally defined as an abrupt change in beach slope (greater than 45°) at least 18 inches in height that persists for a distance of 100 feet or more. The location of both the northern and southern terminus of each scarp will be recorded by GPS and average scarp height assigned to one of three categories (0 to 2 feet, 2 to 4

feet, and 4 feet or higher). Additionally, the maximum height of each scarp will be measured. The location (relative to R-monuments), approximate length, height category, maximum height, and percentage of beach scarped will be presented in tabular and/or graphic format for reporting purposes. EAI will notify APTIM of any persistent scarps within the Project Area that may interfere with sea turtle nesting. APTIM shall be responsible for notifying FWC of the presence of those scarps and for coordinating any remediation measures, if required. ***Scarp monitoring will be charged at a weekly rate. Any services required of EAI during scarp consultation and leveling will be charged separately on a time and materials basis.***

Tasks 6a-6b: Lighting Surveys (FDEP Specific Condition 20)

Two surveys (one between May 1 and May 15 and another between July 15 and August 1) of beachfront lighting conditions within the Project Area will be performed. The location, number, and type of lights visible from the beach and not in compliance with Indian River County's lighting regulations will be documented and reported to the County. Photos (long exposure, without flash) will also be taken of all lights visible from the nourished beach.

A sub-meter GPS will be used to record coordinates from which observations are made and results will be provided to APTIM in standard report form as well as on an Excel spreadsheet. Reports, including recommendations for correcting problem lights, will be provided within 30 days of each survey.

It shall be the responsibility of APTIM to work with Indian River County to notify property owners of non-compliant lights. Following submission of an annual report on enforcement actions (to be prepared by APTIM/Indian River County), an EAI lighting specialist will participate in a meeting with APTIM, Indian River County, FWC, and USFWS to discuss the survey reports and marine turtle disorientations documented within the Project Area.

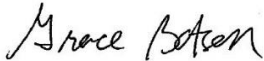
Tasks 7a-7b: Reporting (FDEP Specific Condition 19)

1. **Nesting Season Summary:** A report summarizing methods, numbers of sea turtle emergences by species, nest fates of all marked nests, and reproductive success of evaluated nests, and an assessment of project performance on sea turtle nesting and reproductive success, including interpretive analyses and graphic representations, will be prepared and submitted to APTIM within 90 days of the completion of all monitoring activities.
2. **Summary Spreadsheet of Sea Turtle Nesting Activity:** At the end of the 2022 nesting season, a permit-required Excel spreadsheet summarizing all nesting activity and reproductive success within the Project and Reference Areas will be prepared and submitted electronically to APTIM/Indian River County, JCP Compliance, and FWC.

EAI will submit its monthly billings for the services described above to APTIM in accordance with the fees and schedules set forth in Attachment A. No deposit or advance mobilization fees are required.

Ecological Associates, Inc. appreciates the opportunity to be of continued service to APTIM. Should you have any questions regarding the enclosed Scope of Work or associated costs, I can be reached at (772) 334-3729.

Sincerely,



Grace Botson
Project Manager

c: Niki Desjardin/Director of Operations

ATTACHMENT A
ECOLOGICAL ASSOCIATES, INC.
P.O. BOX 405
JENSEN BEACH, FLORIDA 34958

COST PROPOSAL – February 7, 2022

PROJECT NAME: Sector 3 Phase 1 Post-construction Sea Turtle Monitoring Program – 2022 (Project No. 22-3943A)

CLIENT: Ms. Nicole Sharp
 2481 NW Boca Raton Blvd.
 Boca Raton, FL 33431
 Phone: (561) 361-3150* Email: nicole.sharp@aptim.com

PROJECT DESCRIPTION: Post-construction sea turtle monitoring and ancillary professional services in support of the Sector 3 Beach and Dune Nourishment Project Phase 1, as described in EAI’s Scope of Work dated February 7, 2022.

PROJECT DURATION: February 2022 – February 2023.

PROJECT COSTS: All services will be provided at the fixed rates specified below (*except where noted*), inclusive of all time and materials required to perform the Scope of Work.

Task	Description	Cost
1	Mobilization	\$868.00
2	Project management	\$2,340.00
3	Daily sea turtle monitoring and data management (<i>Daily rate; estimate 269 days at \$308.62 per day</i>)	\$83,018.78
4	Nest marking and monitoring and determination of nest fate and reproductive success (<i>Per nest rate; not to exceed 150 nests at \$66.20</i>)	\$9,930.00
5a	Post-construction (pre-season) escarpment survey and reporting (<i>if required</i>)	\$488.88
5b	Weekly escarpment surveys and reporting (<i>Weekly rate; not to exceed 35 weeks at \$113.57 per week</i>)	\$3,974.95
6a	Nighttime lighting surveys and reporting (<i>Per survey rate; two surveys at \$1,983.91 each</i>)	\$3,967.82
6b	Post-season lighting meeting with FWC (<i>if required</i>)	\$540.00
7a	Final interpretive report	\$2,474.00
7b	FWC nourishment reporting Excel spreadsheet	\$2,290.00
TOTAL (not to exceed)		\$109,892.43

TERMS: All terms and conditions related to this Scope of Work will be governed under EAI’s Work Agreement with APTIM for Environmental and Biological Support Services dated February 9, 2018.



Ms. Nicole Sharp
APTIM
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431

February 7, 2022

Dear Ms. Sharp:

Ecological Associates, Inc. (EAI) is pleased to submit its Scope of Work and Cost Proposal for providing professional environmental services in support of Indian River County's Sector 3 Beach and Dune Nourishment Project. This proposal addresses post-construction sea turtle and shorebird permit-compliance monitoring along approximately 2.95 miles of beach (Phase 2) during the 2022 nesting season, along with an appropriate reference beach, as described in the Scope of Work presented below. This monitoring will comply with all applicable conditions set forth in the regulatory permits and related authorizations issued for the project.

SCOPE OF WORK

This scope of work was developed based on conditions and requirements set forth in standard regulatory permits and the following documents:

- Florida Department of Environmental Protection (FDEP) Joint Coastal Permit (JCP) No. 0285993-009-JC
- U.S. Fish and Wildlife Service (USFWS) Revised Statewide Programmatic Biological Opinion (BO) dated March 13, 2015

Task 1: Mobilization

All equipment, staff, and schedules will be prepared prior to project commencement. The Phase 2 Project Area extends approximately 2.95 miles from FDEP Range Monument R-40 to R-55. The Reference Area, approximately 0.95 miles south of the Project and outside of the influence of any fill placement activities, lies between R-60 and R-68. Pre-existing survey zone boundaries, consistent with those established by Indian River County under its Habitat Conservation Plan, will be verified and re-marked, and project-specific data sheets and a database will be created.

Task 2: Project Management

An EAI project manager will oversee all fieldwork and data management operations, participate in weekly check-in meetings with APTIM/Indian River County, and consult with APTIM on permit requirements, as necessary. A project schedule, as well as field survey schedules, will be created and maintained throughout the life of the project. All equipment and supplies necessary to successfully implement this Scope of Work are available.

Task 3: Daily Sea Turtle Monitoring and Data Management (FDEP Specific Condition 15)

Following completion of construction or beginning on March 1, 2022 (whichever is later), EAI will conduct daily morning sea turtle nesting surveys of the Project and Reference Areas. Surveys will continue through November 11, 2022 or until two (2) weeks without a crawl in the Project Area, whichever is earlier. If there is a two-week period where no crawls are documented in the Project Area, EAI will request a waiver from the USFWS and FWC to discontinue daily monitoring. If permission is granted, EAI will then perform surveys three days per week to monitor marked nests.

Surveys will commence within 30 minutes of sunrise. Monitoring will be performed by EAI staff either on foot or using ATVs. All emergences (turtle crawls) apparent from the previous night will be interpreted to determine which species of turtle came ashore and whether or not it nested. Crawls will be denoted as being above or below the previous high tide line. The approximate geographic location of each crawl will be determined by GPS (sub-meter accuracy). In addition to segregating crawls into nesting and non-nesting emergences (false crawls), each false crawl will be assigned to one of the following categories denoting the stage at which the nesting attempt was abandoned: no digging, abandoned body pit, or abandoned egg cavity. Any obstacles encountered by turtles during their crawls will be documented.

Disorientation Reporting. During the course of daily monitoring, any evidence of hatchling misorientation or disorientation from either marked or unmarked nests will be documented using FWC's electronic Marine Turtle Hatchling Disorientation Incident Report Form. Based on track evaluations, an estimate of the number of hatchlings disoriented will be recorded and light sources potentially responsible for the disorientation identified. Information concerning each incident will be forwarded by email to Indian River County on a weekly basis so appropriate remedial action may be taken.

Stranding and Salvage. A requirement of FWC sea turtle permit holders conducting nesting surveys is to respond to the stranding of sick, injured, and dead sea turtles within their survey area. These animals are examined, and if alive, transported to state-approved care facilities. A standard Sea Turtle Stranding and Salvage data form will be completed and submitted for each stranded animal encountered by EAI. This information will be transmitted to FWC in accordance with established guidelines.

State and Federal Authorizations. All sea turtle monitoring and related activities will be performed under FWC Marine Turtle Permit #261 issued by FWC to EAI Director of Operations, Niki Desjardin. All persons engaged in monitoring performed by EAI for the Sector 3 Beach and Dune Nourishment Project will be listed on the permit.

All data will be subject to rigorous QA/QC protocols and stored in EAI's project-specific database. Monthly summary reports will be furnished to APTIM. These reports will tabulate the dates and times of monitoring, names of monitoring personnel, numbers of sea turtle emergences by species, and numbers of nests marked and evaluated for reproductive success, as applicable. Monthly reports will be submitted to APTIM on the last day of the month following delivery of services (e.g., March report due no later than April 30), or as otherwise mutually agreed upon. *Daily sea turtle monitoring will be charged at a daily rate. *Monthly summary reports on sea turtle nesting and predation will also be sent to Archie Carr National Wildlife Refuge to assist management efforts.*

Task 4: Nest Marking and Monitoring (FDEP Specific Condition 15)

A representative sample of nests in the Project and Reference Areas will be marked for determination of nest fate and reproductive success (not to exceed 150 nests total). Nests will be marked using a series of stakes and surveyor's tape. These nests will be monitored throughout their incubation period to determine nest fate (e.g., hatched, washed out, depredated, vandalized, etc.). After an appropriate incubation period, and in accordance with the FWC Handbook, nests will be excavated to determine reproductive success. Two measures of reproductive success will be calculated: hatching success (the percentage of eggs in the nest that hatch) and emerging success (the percentage of eggs in the nest that produce hatchlings which successfully escape from the nest).

Task 5: Nesting Shorebird Monitoring (FDEP Specific Condition 21)

Following completion of construction, EAI will conduct surveys to identify shorebird/seabird nesting activity in the Project Area weekly through September 1, 2022 if no shorebird nesting activity is observed. The surveys will be conducted on foot or by ATV at dawn and will cover all potential beach nesting bird habitats that may be impacted by construction activities. EAI will report all breeding activity to the Florida Shorebird Database within one week of data collection. Shorebird monitoring activities will comply with all protocols outlined on the Florida Shorebird Database website. *Nesting shorebird surveys will be charged at a per survey rate. *If construction activities take place entirely outside the breeding season, shorebird surveys are not required.*

Tasks 6a-6b: Post-Construction Escarpment Surveys (FDEP Specific Condition 18)

If construction is completed prior to March 1, 2022, a pre-season escarpment (scarp)

survey will be conducted within the Sector 3 Phase 2 Project Area immediately following completion of sand placement and two weeks prior to sea turtle nesting season. The length, average height category, and approximate maximum height (as described below) will be recorded for all scarps that may impede turtles from reaching suitable nesting habitat. A summary report will be provided to APTIM so that actions may be taken to remove the scarps prior to nesting season, if necessary. ***The pre-season scarp survey will be charged only if the survey is necessary.***

Following completion of construction or beginning on March 1, 2022 (whichever is later), scarp surveys will be conducted on a weekly basis within the Sector 3 Phase 2 Project Area through October 31, 2022. In accordance with FWC protocol, scarps are functionally defined as an abrupt change in beach slope (greater than 45°) at least 18 inches in height that persists for a distance of 100 feet or more. The location of both the northern and southern terminus of each scarp will be recorded by GPS and average scarp height assigned to one of three categories (0 to 2 feet, 2 to 4 feet, and 4 feet or higher). Additionally, the maximum height of each scarp will be measured. The location (relative to R-monuments), approximate length, height category, maximum height, and percentage of beach scarped will be presented in tabular and/or graphic format for reporting purposes. EAI will notify APTIM of any persistent scarps within the Project Area that may interfere with sea turtle nesting. APTIM shall be responsible for notifying FWC of the presence of those scarps and for coordinating any remediation measures, if required. ***Scarp monitoring will be charged at a weekly rate. Any services required of EAI during scarp consultation and leveling will be charged separately on a time and materials basis.***

Tasks 7a-7b: Lighting Surveys (FDEP Specific Condition 20)

Two surveys (one between May 1 and May 15 and another between July 15 and August 1) of beachfront lighting conditions within the Project Area will be performed. The location, number, and type of lights visible from the beach and not in compliance with Indian River County's lighting regulations will be documented and reported to the County. Photos (long exposure, without flash) will also be taken of all lights visible from the nourished beach.

A sub-meter GPS will be used to record coordinates from which observations are made and results will be provided to APTIM in standard report form as well as on an Excel spreadsheet. Reports, including recommendations for correcting problem lights, will be provided within 30 days of each survey.

It shall be the responsibility of APTIM to work with Indian River County to notify property owners of non-compliant lights. Following submission of an annual report on enforcement actions (to be prepared by APTIM/Indian River County), an EAI lighting specialist will participate in a meeting with APTIM, Indian River County, FWC, and USFWS to discuss the survey reports and marine turtle disorientations documented within the Project Area.

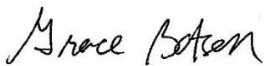
Tasks 8a-8b: Reporting (FDEP Specific Condition 19)

1. **Nesting Season Summary:** A report summarizing methods, numbers of sea turtle emergences by species, nest fates of all marked nests, and reproductive success of evaluated nests, and an assessment of project performance on sea turtle nesting and reproductive success, including interpretive analyses and graphic representations, will be prepared and submitted to APTIM within 90 days of the completion of all monitoring activities.
2. **Summary Spreadsheet of Sea Turtle Nesting Activity:** At the end of the 2022 nesting season, a permit-required Excel spreadsheet summarizing all nesting activity and reproductive success within the Project and Reference Areas will be prepared and submitted electronically to APTIM/Indian River County, JCP Compliance, and FWC.

EAI will submit its monthly billings for the services described above to APTIM in accordance with the fees and schedules set forth in Attachment A. No deposit or advance mobilization fees are required.

Ecological Associates, Inc. appreciates the opportunity to be of continued service to APTIM. Should you have any questions regarding the enclosed Scope of Work or associated costs, I can be reached at (772) 334-3729.

Sincerely,



Grace Botson
Project Manager

c: Niki Desjardin/Director of Operations

ATTACHMENT A
ECOLOGICAL ASSOCIATES, INC.
P.O. BOX 405
JENSEN BEACH, FLORIDA 34958

COST PROPOSAL – February 7, 2022

PROJECT NAME: Sector 3 Phase 2 Post-construction Sea Turtle Monitoring Program – 2022 (Project No. 22-3943B)

CLIENT: Ms. Nicole Sharp
 2481 NW Boca Raton Blvd.
 Boca Raton, FL 33431
 Phone: (561) 361-3150* Email: nicole.sharp@aptim.com

PROJECT DESCRIPTION: Post-construction sea turtle and shorebird monitoring and ancillary professional services in support of the Sector 3 Beach and Dune Nourishment Project Phase 2, as described in EAI’s Scope of Work dated February 7, 2022.

PROJECT DURATION: February 2022 – February 2023.

PROJECT COSTS: All services will be provided at the fixed rates specified below (*except where noted*), inclusive of all time and materials required to perform the Scope of Work.

Task	Description	Cost
1	Mobilization	\$868.00
2	Project management	\$2,340.00
3	Daily sea turtle monitoring and data management (<i>Daily rate; estimate 269 days at \$308.62 per day</i>)	\$83,018.78
4	Nest marking and monitoring and determination of nest fate and reproductive success (<i>Per nest rate; not to exceed 150 nests at \$66.20</i>)	\$9,930.00
5	Weekly shorebird nesting surveys (<i>Per survey rate; not to exceed 25 surveys at \$117.00 per survey</i>)	\$2,925.00
6a	Post-construction (pre-season) escarpment survey and reporting (<i>if required</i>)	\$488.88
6b	Weekly escarpment surveys and reporting (<i>Weekly rate; not to exceed 35 weeks at \$113.57 per week</i>)	\$3,974.95
7a	Nighttime lighting surveys and reporting (<i>Per survey rate; two surveys at \$2,091.91 each</i>)	\$4,183.82
7b	Post-season lighting meeting with FWC (<i>if required</i>)	\$540.00
8a	Final interpretive report	\$2,474.00
8b	FWC nourishment reporting Excel spreadsheet	\$2,290.00
TOTAL (not to exceed)		\$113,033.43

TERMS: All terms and conditions related to this Scope of Work will be governed under EAI's Work Agreement with APTIM for Environmental and Biological Support Services dated February 9, 2018.