

# Johns Lake Outfall Canal Evaluation Study

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**Task Authorization No. \_\_\_\_**

**Orange County Stormwater Management Division**

**Exhibit “A”**

**Johns Lake Outfall Canal Evaluation Study**

**March 2024**

This Task Authorization (TA), when executed, shall be incorporated in, and become part of the Y21-905D Agreement for Professional Services between the Orange County Board of County Commissioners (COUNTY) Stormwater Management Division, and CDM Smith Inc. (CONSULTANT), dated November 3, 2021, hereafter referred to as the Agreement.

## Background

The COUNTY requested the CONSULTANT to evaluate the reported erosion within the Johns Lake Outfall Canal (Motomassic Canal) following Hurricane Ian that impacted Central Florida on September 29, 2022. As a result of the damage, several impacted stakeholders reached out to COUNTY staff seeking additional assistance in developing a long-term plan to address both Capital Improvement Project (CIP) needs and long-term Operation and Maintenance (O&M) needs to improve stormwater management within the Johns Lake Outfall Canal (the Canal). The initial stakeholders seeking additional support from the COUNTY included:

- The COUNTY
- The Town of Oakland
- Representatives of the Oakland Park Development

Part of the challenge of developing the study was based upon financial responsibilities and cost sharing as the Canal is within the Town of Oakland and there are no existing easements to implement a CIP or to implement an O&M program.

Between May 2022 and February 2024, Oakland Park Development, the Town of Oakland, and the COUNTY undertook several projects that would benefit the Canal between West Orange Trail and Lake Apopka. These generally included:

- Completing the design and permitting of the Oakland Park Phase 7 Canal improvements, which included the widening of the canal and the construction of a stilling basin to remove some of the steepness of the existing canal as part of an improved erosion management plan between West Orange Trail and Lake Apopka. Environmental Resource Permit (ERP) No. 102535-37 was secured from the St. Johns River Water Management District (SJRWMD) for this project.

- Design and construction of replacement culverts across the Canal to improve access roads needed by the Town of Oakland and Oakland Park.
- Regrading of the sediment build-up that occurred following Hurricane Ian at the Canal's confluence with Lake Apopka to re-establish the historic flow-path away from private property within the Southern Oaks at Oakland Shores subdivision.
- The COUNTY also stabilized and repaired the bank failures in the vicinity of the West Orange Trail.

During this same period, the COUNTY requested that CDM Smith develop a scope of services to compliment the work being completed by the Town of Oakland and Oakland Park. The scope developed focused on the Canal between West Colonial Drive (SR 50) and the West Orange Trail. Following several discussions with project stakeholders, an agreement was reached for the study to include the entire length of the Canal between SR 50 and Lake Apopka, so that the work being done on behalf of Oakland Park and the Town of Oakland was captured in a single document for the purposes of having a comprehensive plan that could also be used to discuss future cost sharing opportunities. The updated list of Stakeholders for this effort included:

- The COUNTY
- The Town of Oakland
- Representatives of the Oakland Park Development
- Friends of Lake Apopka
- The SJRWMD

The main elements of the consolidated study requested by the project Stakeholders are as follows:

- Monthly coordination meetings with the COUNTY identified stakeholders.
- Incorporation of the survey, stormwater modeling, and design plans developed by Oakland Park to secure the ERP for the Oakland Park Phase 7 Canal improvements.
- Collection of additional survey between SR 50 and West Orange Trail.
- Identification of potential bank stability needs within areas of observed channel bank stability deficiencies (slope failures) to compliment the ongoing efforts by Oakland Park for Canal improvements.
- An update to the recommended easement acquisition plan in the 2021 Phase 1 Study for long-term Operation and Maintenance (O&M) purposes and associated costs.

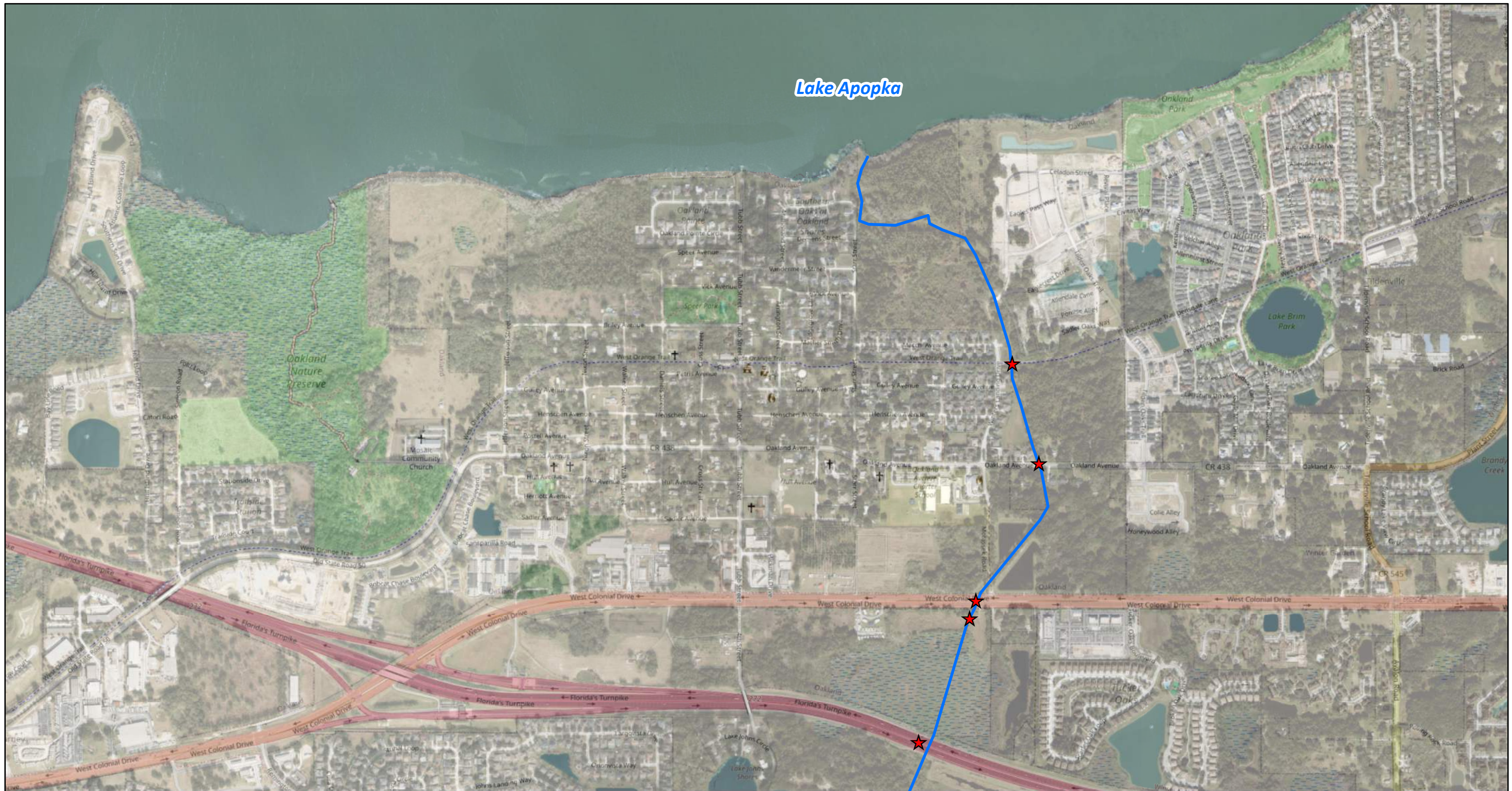
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- Development of potential cost share methods for easement acquisition, long-term O&M, and Capital Improvement Projects (CIP) to entities that contribute stormwater to the Johns Lake Watershed.
- Recommendations for a long-term improvement plan for the entire Johns Lake Outfall Canal in a single document to be shared with the Stakeholders.

This evaluation will build upon both the results presented in the Johns Lake Outfall Study and Conceptual Design (2021 Phase 1 Study) completed by the CONSULTANT for the COUNTY and the work completed by Oakland Park. The study area for this evaluation is presented on **Figure 1**.

The CONSULTANT will complete the requested services as defined in the Scope of Work listed below. Pegasus Engineering (Pegasus), Southeastern Surveying and Mapping Corporation (SSMC), and Geotechnical and Environmental Consultants, Inc. (GEC) will be assisting the CONSULTANT as subconsultants to perform the tasks described in the Scope of Work. Proposals from each of these companies are included in **Attachments 1, 2, and 3**, respectively.



Lake Apopka



**Legend**

- ★ Structures
- Outfall Channel

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1 inch = 981 feet  
 0 250 500 1,000  
 Feet

Figure 1



### Scope of Work

#### Task 1 Data Collection

##### Subtask 1.1 Data Compilation

The CONSULTANT and Pegasus will review the following data provided by the project Stakeholders:

- Historical topographic map data for the Canal.
- Photographs taken by the Stakeholders following Hurricane Ian.
- Supporting data collected in support of the Oakland Park Phase 7 North Hydraulic Modeling Documentation prepared by bcc engineering (survey, development plans, stormwater model, geotechnical reports, etc.).
- Final construction drawings for the Oakland Park Phase 7 Canal Widening and Stilling Basin Project (ERP No. 102535-37).
- Current work products being developed by Oakland Park associated with the Phase 6B Canal Improvements north of the West Orange Trail.
- Canal crossing improvements being completed for the Town of Oakland and/or Oakland Park.
- Available historic and/or budgeting easement acquisition costs for similar projects.

Additionally, the CONSULTANT and Pegasus will jointly perform a field walk of the Canal between SR 50 and Lake Apopka to identify potential erosion problems and likely major sources of sedimentation based on visual observation. The CONSULTANT will map these areas using Geographic Information System (GIS) tools on 11-inch by 17-inch maps. As the Canal is on private property, the COUNTY and the Town of Oakland will be responsible for securing approved access to the Canal for the field inspection.

##### Subtask 1.2 Supplemental Survey Needs

Under guidance from the CONSULTANT, SSMC will develop a topographic survey of the project between SR 50 and the West Orange Trail. The survey will generally include the development of a topographic map along the Canal, the location of property boundaries based upon published data (no field verification), existing culverts, and select cross-sections to supplement previous work done for the COUNTY and for Oakland Park.

##### Subtask 1.3 Supplemental Geotechnical Evaluations

Under the guidance of the CONSULTANT, GEC will conduct a geotechnical exploration of a maximum of three locations of noted bank stability issues along the Canal. This assessment will include recommended repair measures as defined in their attached proposal.

## Task 2 Stormwater Model Update

### Subtask 2.1 Oakland Park Stormwater Model Review

The CONSULTANT will review the stormwater model developed for the Canal for Oakland Park between the West Orange Trail and Lake Apopka and provide review comments to the Stakeholders. The CONSULTANT assumes that any modeling concerns be addressed by Oakland Park for use in this study.

### Subtask 2.2 Stormwater Model Update

The CONSULTANT will update the existing ICPR4 model developed for the 2021 Phase 1 Study between SR 50 and the West Orange Trail using the survey data collected under Subtask 1.2. Following the integration of the new survey data, the CONSULTANT will provide the updated model to the Stakeholders. It will be the responsibility of Oakland Park to compare the updated model and the comments provided by the CONSULTANT for use in their development plans.

Using the updated stormwater model between Johns Lake and the West Orange Trail, the CONSULTANT will simulate the design storm events presented in **Table 1** using the Orange County rainfall distribution.

**Table 1 - Design Storm Events**

| Design Storm Event  | Rainfall (inches) |
|---------------------|-------------------|
| Mean-Annual/24-hour | 4.5               |
| 10-year/24-hour     | 7.5               |
| 25-year/24-hour     | 8.6               |
| 100-year/24-hour    | 10.6              |

A summary table of the peak water surface elevations, flows, and velocities along the Canal will be developed using the updated ICPR4 model. These results will be shared with the representatives from the Oakland Park Development to support their ongoing stormwater modeling efforts.

## Task 3 Canal Improvement Alternatives

### Subtask 3.1 West Orange Trail to Lake Apopka

The CONSULTANT will review and comment on the planned and ongoing work efforts by the Stakeholders. These shall include:

- Final construction drawings for the Oakland Park Phase 7 Canal Widening and Stilling Basin Project (ERP No. 102535-37).
- Construction plans for Phase 6B of the Oakland Park Subdivision related to the Johns Lake Outfall Canal.
- Canal crossing improvements being completed for the Town of Oakland and/or Oakland Park.
- Sediment removal at the confluence if the Johns Lake Outfall Canal with Lake Apopka.

These efforts will be summarized in the draft and final reports prepared under Task 6.

**Subtask 3.2 West Colonial Drive to the West Orange Trail**

Under the direction of the CONSULTANT, Pegasus will conduct two meetings with the project Stakeholders (budgeted under Task 5) to discuss potential structural canal improvement alternatives. Pegasus will evaluate up to three alternatives to address identified erosion problem areas and areas in need of general O&M for conveyance purposes along the Canal. This will include consideration of the improvements being completed by Oakland Park between the West Orange Trail and Lake Apopka and consideration of potential future improvements identified by Oakland Park (Subtask 3.1). It is anticipated that the slope stabilization improvements will include gabion baskets, reno mattresses, retaining walls, articulated concrete block (ACB) mats, and geotextile materials. Pegasus will develop 10 percent conceptual drawings using AutoCAD of a recommended improvement for up to two locations using aerial photography, existing topographic contours, parcel data, and drainage infrastructure as noted in **Table 2**. The maps listed in Table 2 will be prepared in 11-inch by 17-inch format for reporting purposes.

**Table 2 Budgeted Alternative Concept Plan Sheets**

| Sheet Description                            | Sheet Count |
|--|-------------|
| Project Site Map                             | 1           |
| Project Model Schematic & Sub-Basin Map      | 1           |
| Existing FEMA Floodplain (project site only) | 1           |
| Existing NWI Wetland Map (project site only) | 1           |
| Existing Conditions Land Use Map             | 1           |
| Existing Conditions NRCS Soils Map           | 1           |
| Existing Conditions – Plan View              | 4           |
| Alternative 1 – Plan View                    | 4           |
| Alternative 2 – Plan & Profile View          | 4           |
| Alternative 3 – Plan View                    | 4           |
| <b>Total</b>                                 | <b>22</b>   |

**Subtask 3.2 Engineer’s Opinion of Probable Construction Cost (OPCC)**

Pegasus will develop an engineer’s opinion of probable construction cost (OPCC) for recommended (one) alternative developed under Subtask 3.1 as chosen by the project stakeholders. Additionally, it is assumed that there will be no wetland impacts to be mitigated nor the need for environmental remediation. If these concerns arise during this study, the CONSULTANT will bring this to the attention of the COUNTY.

**Subtask 3.3 Easement Acquisition Plan**

Pegasus will update the recommended easement acquisition plan presented in the 2021 Phase 1 Study for long-term Operation and Maintenance (O&M) purposes and associated costs.

**Task 4 Cost Sharing Alternatives**

The CONSULTANT will evaluate two alternative cost sharing mechanisms which may consider contributing area, runoff volumes, and/or contributing impervious area for the recommended improvements and long-term O&M needs (e.g., right-of-way acquisition). Implementation of a cost sharing program is not part of this scope of services.

### Task 5 Stakeholder Meetings

The CONSULTANT and Pegasus will assist the COUNTY in participating in up to eight meetings with the following project Stakeholders (joint meetings):

1. The COUNTY
2. The Town of Oakland
3. Representatives of the Oakland Park Development
4. Friends of Lake Apopka
5. The SJRWMD

The CONSULTANT shall prepare meeting materials and summary meeting notes from each meeting attended. The County will be responsible for identifying and securing an appropriate meeting venue as well as sending out meeting invitations to the project Stakeholders.

### Task 6 Report

The CONSULTANT will prepare a Draft and Final Canal Assessment Study report. The report will include the following major sections:

1. Introduction
2. Data Collection
3. Stormwater Modeling
  - West Orange Trail to Lake Apopka Model Review and Comment
  - West Colonial Drive to the West Orange Trail Model Update
4. Alternatives Analysis
  - West Orange Trail to Lake Apopka
  - West Colonial Drive to the West Orange Trail
5. Recommended Plan
  - OPCC
  - Cost Sharing Opportunities

The CONSULTANT will provide one copy of the Draft Report in electronic format for Stakeholder review. The COUNTY will consolidate comments on the draft report and provide them to the CONSULTANT. The CONSULTANT and Pegasus will incorporate review comments as mutually agreed upon and submit one final copy of the Final Report in digital format.



### Task 7 Project Quality Management and Meetings

Activities performed under this task consist of those general functions required to maintain the project on schedule, within budget, and that the quality of the work products within this scope is consistent with CONSULTANT's standards and COUNTY's requirements. Specific activities included are identified below:

#### Subtask 7.1 Project Progress Meetings

The CONSULTANT will participate in one project Kick-Off meeting, and two project status review management meetings with the COUNTY. The first meeting is a status meeting to discuss the results of the data collection effort and survey needs request. The second meeting is a status meeting to discuss proposed alternatives. The CONSULTANT will prepare meeting notes following each meeting and distribute to the COUNTY.

#### Subtask 7.2 Project Quality Management

The CONSULTANT maintains a quality management system (QMS) for COUNTY projects performed by CONSULTANT. An internal project planning and scope review meeting will be conducted at the start of the project. CONSULTANT will assist with coordinating the work activities with the subconsultants and provide oversight during preparation of their deliverables. This action is required by CONSULTANT's QMS guidelines. Technical specialist reviews are budgeted for and will be performed to review various submittals prepared by CONSULTANT and subconsultants. A Technical Review Committee (TRC) review will be performed on the 10 percent conceptual drawing design milestone.

#### Subtask 7.3 Project Status Reports

The CONSULTANT's project manager will prepare and submit a monthly written status report and invoice for the anticipated project duration of nine months. If the project can be accelerated, the CONSULTANT will make a reasonable effort to do so to meet the expectations of the COUNTY. Additionally, the CONSULTANT will provide bi-weekly email updates.

### DATA OR COORDINATION ASSISTANCE TO BE PROVIDED BY THE COUNTY

1. Latest Development Plans for properties along the Johns Lake Outfall Canal as made available by the Town of Oakland and/or representatives from the Oakland Park Development. These data include:
  - Canal survey data / cross sections completed by others for Oakland Park.
  - Geotechnical reports completed by others for Oakland Park.
  - ICPR4 model with the report documentation completed by others for Oakland Park.
  - Permitted improvements: Phase 7 canal improvements (widening with control structure).
  - Preliminary Design Elements within Oakland Park for Phase 6B3 canal channel widening and erosion repairs.

- Preliminary evaluations regarding the removal and replacement of existing culvert crossings within the Johns Lake Outfall Canal.
- 2. Field investigation notes from COUNTY staff and the Stakeholders who have visited the site post-Hurricane Ian (e.g., field photographs).
- 3. Available erosion and/or flooding complaints received by the COUNTY post-Hurricane Ian.
- 4. Rainfall and lake level data, as available, that is representative of the Johns Lake Watershed.
- 5. Updated easement acquisition costs/guidance from the COUNTY.

### ASSUMPTIONS

The above-described engineering services have been based upon the following assumptions:

1. The CONSULTANT will rely upon findings presented in the 2021 Study previously referenced in this document including available ICPR4 stormwater model data and documented results.
2. The Canal study area will be limited to the Canal segment between SR 50 (West Colonial Drive) and the Lake Apopka.
3. No pollutant load modeling to quantify the water quality benefits of improvement measures will be provided.
4. Engineering services related to environmental assessments, mitigation plans, or surveying of any jurisdictional wetlands are not included in this proposal.
5. Alternative improvement concepts will be represented with AutoCAD sketches and conceptual cost estimates for each of the two selected alternatives. The sketches and costs are for planning purposes only and are not intended for use in final design or construction.
6. This Task Authorization does not include the implementation of a cost sharing program or final design services.
7. The CONSULTANT will provide the COUNTY with a conceptual OPCC based upon available market information for the recommended alternative (one). The OPCC will be based on the FDOT current year price index and/or applicable available information representing recent bids and current market information. The CONSULTANT does not control market pricing for constructors.
8. The CONSULTANT's OPCC does not include mitigation or environmental remediation. However, there is the potential for these unforeseen conditions to arise during permitting, final design, or construction. Therefore, this qualifying note is added as an advisory due to the unpredictable (and currently unforeseen) nature of these efforts and costs.

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9. The draft and final report will include a plan for the Johns Lake Outfall Canal between SR 50 and Lake Apopka.
10. This study does not include any commitments of additional services or funding of efforts identified in the recommended plan by the COUNTY or the Stakeholders.
11. This Task Authorization does not include revising the ICPR model prepared by BCC Engineering.

### DELIVERABLES

1. One digital copy of the Draft and one digital copy of the Final Johns Lake Outfall Canal Assessment Study report.
2. Meeting summary notes from meetings attended by the CONSULTANT.
3. Participation in up to eight Stakeholder meetings arranged by the COUNTY, including the development of meeting presentation materials and summary meeting notes.
4. Monthly progress reports and associated invoices in digital format.
5. Bi-weekly email updates will be submitted to the COUNTY summarizing project status.

### TIME OF COMPLETION/SCHEDULE

It is anticipated that the Project will take nine months to complete, starting within two weeks of receipt of formal notice to proceed (NTP). CONSULTANT will prepare an updated detailed schedule within the first thirty (30) calendar days after NTP.

### COMPENSATION AND PAYMENT

For the services performed under this Task Authorization, the COUNTY agrees to pay the CONSULTANT the lump sum fee of \$xxxxx partial payments to be made monthly in proportion to the percentage of work completed. The fee build-up for the lump sum amount is presented in **Table 3** and **Table 4**.

Table 3

Table 4



## Attachments

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- **Pegasus Engineering (Pegasus)**
- **Southeastern Surveying and Mapping Corporation (SSMC)**
- **Geotechnical and Environmental Consultants, Inc. (GEC)**

**Attachment 1**

**Pegasus Engineering (Pegasus)**



**Attachment 2**

**Southeastern Surveying and Mapping Corporation (SSMC)**

**Attachment 3**

**Geotechnical and Environmental Consultants, Inc. (GEC)**