**DRAFT**

# TASK 3: Water Quality Characterization

**CORAL REEF PROTECTION AND RESTORATION (CPR) GRANT**
**WORK PLAN**
**DEP CPR GRANT AGREEMENT NO. C2001**

**I. PROJECT TITLE:** Biscayne Bay Water Quality Characterization and Pollution Reduction, Miami Dade County (MDC)

**II. PROJECT LOCATION(S):** The projects will be located within several municipalities including but not limited to Miami, Hialeah, and Village of El Portal and various locations in Unincorporated Miami-Dade County within Miami-Dade County.

## III. PROJECT BACKGROUND:

Biscayne Bay is an historically oligotrophic (i.e., low nutrient), shallow estuary bordered by mainland Miami-Dade County (MDC) to the west and Miami Beach and other barrier islands to the east. Facilitating the development of residential areas, travel corridors, and commercial enterprise, significant changes were made to the area's natural hydrology including but not limited to the channelization of rivers into canals, drainage of wetlands, and the dredging and filling of Biscayne Bay. Flood mitigation strategies in the County's highly developed, urbanized landscape largely rely on drainage systems along streets and in neighborhoods that most often lead to outfalls that discharge into surface water canals which ultimately discharge into Biscayne Bay.

Several published studies along with MDC Department of Regulatory and Economic Resources – Division of Environmental Management (DERM)'s historical water quality data and seagrass survey data as summarized in the "Report on the Findings of the County's Study on the Decline of Seagrass and Hardbottom Habitat in Biscayne Bay" per MDC Board of County Commissioners Directive No. 171537 submitted in January 2019 indicate that chronic, low-level nutrient loading and/or acute, pulsed nutrient loading is likely linked to seagrass losses in Biscayne Bay. Excess nutrients discharged directly or indirectly (via canals or subterrain groundwater) to the Bay can cause eutrophication (i.e., excess of nutrients). Potential sources of these excess nutrients include pet waste, fertilizers, leaky sewer lines, septic systems, and other indirect sources.

One of the most notable potential impacts of nutrient enrichment are the shifts in biomass in seagrass beds that can strain biogeochemical systems and the ability of seagrasses to perform basic physiological functions. Recently, seagrasses in northern Biscayne Bay have been particularly affected, with total percent decrease in seagrass coverage across the affected basins ranging from 77 percent to 93 percent. Phytoplankton, which are microscopic algae in the water column, can thrive when nutrients levels are enriched, potentially causing algal blooms, turbid water conditions, and consumption of dissolved oxygen among other impacts. These impacts can degrade the health of seagrasses, fish, and invertebrates as well as other wildlife that are dependent on a healthy Biscayne Bay. Most recently, in the summers of 2020 and 2021, fish kills were documented in Biscayne Bay in the thousands and hundreds, respectively.

Characterizing the water quality within and emanating from the Miami River, Little River, and Biscayne Canal as well as better understanding potential sources of contaminants will provide important information to municipal, county, state, and federal partners responsible for the recovery of Biscayne Bay. In addition, circulation modeling will better describe the fate and transport of land-based sources of pollution coming from the canals. The water quality and sediment data collected will provide information on the quantity of nutrients and other pollutants to aid in policy decisions and rulemaking at the state, county, and municipal levels (e.g., Total Maximum Daily Load, Reasonable Assurance Plan, and/or nutrient criteria). The data will also serve to identify the sources of nutrients/pollutants (e.g., sewage, fertilizer, etc.) to plan for corrective action. By closing data gaps and identifying those portions of the basins with degraded water quality and potential sources of pollution, policy and regulatory options may be considered.

## IV. PROJECT DESCRIPTION:

This project seeks to characterize surface and groundwater entering Miami River (C-6), Little River (C-7), and Biscayne Canal (C-8) including parameter concentrations and the fate & transport of certain parameters via a two-pronged approach. One approach will be to model water origin & circulation patterns in Biscayne Bay & canals. The second approach will be to design & implement water quality & sediment sampling analysis throughout the canal basins including grab sampling, continuous monitoring technology, & sampling during episodic events. Investigators will bring to bear datasets available via MDC, Florida Department of Environmental Protection (FDEP), South Florida Water Management District (SFWMD), National Oceanic and Atmospheric Administration (NOAA), Florida International University (FIU), University of Miami (UM), and other resources, including recent special sampling events in the stormwater system as part of MDC National Pollution Discharge Elimination System program, to inform the sampling scope & design.

## V. TASKS

**Funding Acknowledgement:** All deliverables, presentations, and social media posts will acknowledge the financial assistance provided by the Florida Department of Environmental Protection's Coral Protection and Restoration Program.

**Performance Standard For All Tasks:** The Department's Grant Manager will review the task deliverable to verify that the deliverable has been completed as described per task section. Upon review and written acceptance by the Department's Grant Manager, the Grantee may proceed with payment request submittal.

All deliverables shall be submitted electronically unless otherwise indicated. All permit(s) must be acquired prior to work starting (if required). All raw data acquired for this project must be submitted to DEP at the end of the project. All final deliverable(s) must comply with Section 508 of the U.S. Rehabilitation Act (as amended), Florida Statute Chapter 282, and Florida Administrative Code (FAC) Rule: 60-8.002.

The contractor must notify DEP when data from this project will be presented or published. Any maps, graphics, charts, or other deliverables intended to visually communicate information should include the following: title and/or appropriate explanation of the visual being presented, consistent

scale bar, north arrow and key, and clearly labeled county lines (if applicable). When submitting photo deliverables, a consistent naming convention and organizational structure will be used that includes the date, site name, and any other relevant information. A separate folder will also be created with a smaller subset of photos (5-15 total) that highlight the overall project and can be used for communication pieces and/or messaging. All final deliverables and invoice(s) will be submitted to DEP by the end of this agreement or earlier. DEP may take up to two weeks to review deliverables.

Each task, as detailed below:

**Task 3.1: Quality Assurance Project Plan – Draft and Final**

**Description:** The Grantee will prepare a Quality Assurance Project Plan (QAP). The QAP must be approved by the Department prior to commencement of any monitoring or research associated with the project. The QAP must specify all key processes/information required for the execution of the work. The Grantee will use the format provided by the Department's Grant Manager (see Exhibit D – Quality Assurance Requirements). This task is to be performed by Grantee.

**Standard and Research QA Exhibit found in Exhibit D:**

The following lists the expected deliverables that are associated with the quality assurance requirements of this Grant:

a. An initial planning review technical audit as specified in Section 5.b.i. of **Exhibit D** shall be completed by the Grantee after the second completed sampling and analysis event, but no later than the fourth. The Grantee shall submit a report of this initial planning review audit within one month of the review, and that report shall include a statement of usability as described in Section 5.b.iii. of **Exhibit D**.
   (i) For research analytes only, when reporting grant field or analytical research results, the Grantee shall submit statements about data usability per Section 8 of **Exhibit D**.
b. Ongoing planning review technical audits shall be conducted annually thereafter for the remainder of the Grant, if applicable to the duration of the Grant, as described in Section 5.b.ii. of **Exhibit D**. The Grantee shall submit a report of each annual planning review audit with a statement of usability (Section 5.b.iii), within one month of the review.
c. The Grantee shall submit the Grant Quality Assurance Plan (QA Plan) as described in Section 6 of **Exhibit D** to the DEP Grant Manager no later than 30 days ***prior to the commencement of field and laboratory activities***. Failure to submit the QA Plan in this required timeframe shall result in a delay of approval to begin work until the document has been submitted to the Department and approved (or conditionally approved) by the DEP Grant Manager.
   (i) The Grantee may submit a version of the QA Plan to the Department for approval no more than three times. If the Grantee fails to obtain approval for the QA Plan after the third (final) submission to the Department, the DEP Grant Manager may suspend or terminate the Grant per the remedies included in the Grant.
   (ii) Within 30 days of receipt of the QA Plan by the Department, the Department shall review and either approve the QA Plan or provide comments to the Grantee as to why the QA Plan is not approved. If further revisions are needed, the Grantee shall then

have 30 days from the receipt of review comments to respond. The Department shall respond to all revisions to the QA Plan within 30 days of receipt of any revisions.

(iii) If the review of the QA Plan by the Department is delayed beyond sixty (60) days after the QA Plan is received by the Department, through no fault of the Grantee, the Grantee shall have the option, after the QA Plan is approved, of requesting an extension in the term of the Grant for a time not to exceed the period of delayed review and approval. This option must be exercised at least sixty (60) days prior to the current termination date of the Grant. The Department shall then determine whether the request for an extension is allowed.

(iv) If any significant changes in sampling project design, changes in the project analyte list, changes in procedures or test methods, changes in equipment, or changes in key personnel occur, the Grantee shall submit appropriate revisions of the QA Plan to the DEP Grant Manager for review in writing. The proposed revisions may not be implemented until they have been approved (or conditionally approved) by the DEP Grant Manager. If the Grantee fails to submit the required revisions, the DEP Grant Manager may suspend or terminate the Grant per the remedies included in the Grant.

**Deliverable(s):** The grantee will submit a draft Quality Assurance Project Plan in Word format and a Final Quality Assurance Project Plan in Word and PDF format.

**Payment Request Schedule:** N/A

**Task 3.2: Reporting**

**Description:** The Grantee will provide a progress and budget report quarterly per Exhibit A. The progress report will summarize the work completed within each task for the reporting period. It will also provide an update on the estimated completion date for each task and an explanation for any anticipated delays or problems encountered. A quarterly budget update will also be included with the progress report. This task is to be performed by Grantee.

**Deliverable(s):** The Grantee will submit: 1) a progress report using Exhibit A in Word format and 2) a budget report in Excel format.

**Payment Request Schedule:** N/A

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**Task 3.3: Water Quality Characterization**

**Description:** Identify sources of water quality pollution in north Biscayne Bay watersheds, with a focus on the Miami River and Inlet Contributing Area (C-6), Little River (C-7), and Biscayne Canal (C-8) basins.

*Task 3.3a (Gardinali):* Produce an inventory of water sources contributing to the Miami River, Little River, and Biscayne Canal watersheds based on existing and available datasets.

**Description:**
The goal will be to identify the key water sources contributing to the Miami River, Little River, and Biscayne Canal watersheds and catalog them as contributors as individual components: surface water endmembers; groundwater (existing monitoring wells); stormwater runoff (main points of discharge/outfalls representing specific basins); wastewaters (sewer infrastructure, septic systems). Unpermitted discharges and connections. This would be accomplished by consultation with the appropriate MDC Divisions as well as DEP, SFWMD, FIU, UM and other regional and national partners. This task also includes a construction of a centralized database with the most currently available water quality data for the watersheds associated with the program. The dataset will be used to explore past and current trends of water quality that help guide the selection of sample sites or collecting systems associated with surface, ground and wastewater distribution and management.

**Deliverable(s):** The grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report of comprehensive characterization of the identified sources including discriminating parameters and variability. 2) Data in excel file or an alternative electronic data deliverable (EDD) format describing the sources, the available datasets and the method of accessing the information.

**Payment Request Schedule:** Quarterly

*Task 3.3b (Gardinali): Water Quality Sampling Program*

**Description:**
The goal will be to collect information on physical, chemical, and biological water characteristics that will provide discriminatory power to identify specific sources of pollution. The parameters will include water quality indicators sampled in historical and existing monitoring programs. Chemical and physical water quality parameters commonly collected across various monitoring programs will be sampled and include, at a minimum, dissolved oxygen and turbidity; nutrients such as TP, TN, Chl-a; toxic metals such as Pb and Cu; Parameters with regulatory relevance will be sampled and analyzed using DEP-approved protocols. An extended list of parameters that will enhance the source discrimination analysis will include, at a minimum, water optical properties (3D Excitation – Emission Matrix of fluorescence components, SUVA, UV-Index, Aromaticity Index), Elemental analysis for analytes not listed as toxic or priority pollutants (some elements such as Ca, Mg, Na, K, Sr and Mn could be used to discriminate sources or Gd that could be specific for medical wastes) and Organic Tracers and Indicators (a series of organic chemicals that are largely unregulated, thus not treated for, that could be used to describe specific influence such a treated vs untreated domestic wasters). Our specific work will include organic compounds that are recalcitrant to both treatment and environmental processes (Splenda, Carbamazepine, Diphenhydramine) and others (that are differentially affected by onsite treatment systems (Septic) and municipal wastewater treatment facilities (reclaimed water or effluents for ocean disposal)). Major anions,

cations, and stable isotopes will also be included in this process. Bacteriological indicators are also a key component of source apportioning.

The parameters noted above will be sampled during each of five sampling events that will occur at a minimum of 30 sampling sites in the Miami River, a minimum of 15 sampling sites in the Little River, and a minimum of 5 sampling sites in the Biscayne Canal. A minimum of 400 water samples will be collected and a minimum of 100 sediment samples. Additional sampling efforts may be considered should a special event occur (i.e., extreme weather events, sanitary sewer overflow, fish kill, etc.)

**Deliverable(s):** The Grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, sample chain of custody and payment records for personnel effort and analytical services. If appropriate documentation of the acquisition of capital equipment items. 2)A report of comprehensive characterization of the identified sources including discriminating parameters and variability. 3) Data in excel format of an alternative electronic data deliverable (EDD) format. 4) A GIS layer depicting sampling locations.

**Payment Request Schedule:** Quarterly

*Task 3.3c (Swart): Characterization of Particulate Material and Sediment Movement*

**Description:**
The sediments within Miami River and Biscayne Bay record the flux of organic material and to some extent the pollution affecting the area. Sediment samples will be co-located with water sampling sites of environmental relevance. These will be analyzed for the content of organic carbon, carbon isotopic composition, nitrogen isotopic composition and C/N ratio. The mineralogy and inorganic content of the sediments will be determined together with bulk major and minor element geochemistry. This study will trace the movement of sediments from the Miami River, Little River, and Biscayne Canal into the relevant Biscayne Bay basins.
Parameters Measured: Carbonate content, Mineralogy (Calcite, aragonite, quartz, other) major and minor elements chemistry, Organic content, C and N isotopic composition, C/N ratio, Grain size. The parameters noted above will be sampled during each of five sampling events that will occur at a minimum of 30 sampling sites in the Miami River, a minimum of 15 sampling sites in the Little River, and a minimum of 5 sampling sites in the Biscayne Canal. A minimum of 100 sediment samples will be collected and a minimum of. Additional sampling efforts may be considered should a special event occur (i.e., extreme weather events, sanitary sewer overflow, fish kill, etc.) All analytical methods are based on standardized protocols or are described in peer reviewed literature.

**Deliverable(s):** The Grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, sample chain of custody and payment records for personnel effort and analytical services. If appropriate documentation of the acquisition of capital equipment items. 2) A report

characterizing particulate matter and sediment in Miami River, Little River, and Biscayne Canal. 3) Data in excel format. 4) A GIS layer depicting sampling locations.

**Payment Request Schedule:** Quarterly

*Task 3.3d (Swart): Relative Contributions of Ground and Surface Water into Miami River, Little River, Biscayne Canal and Environs*

**Description:**
This task will aim to study the input of surface and groundwater into the Miami River and ultimately Biscayne Bay using concentrations of the stable isotopes of H and O and concentration of major and minor elements in water samples collected temporally and spatially. Surface freshwater have elevated H and O isotopic compositions compared to rainwater and groundwater within the metropolitan areas. Groundwater have elevated concentration of Ca which can be observed in the Sr/Ca ratio.

Parameters measured: O, and H isotopes, salinity, Ca, Mg, Na, K, & Sr. The parameters noted above will be sampled during each of five sampling events that will occur at a minimum of 30 sampling sites in the Miami River, a minimum of 15 sampling sites in the Little River, and a minimum of 5 sampling sites in the Biscayne Canal. A minimum of 400 water samples will be collected. Additional sampling efforts may be considered should a special event occur (i.e., extreme weather events, sanitary sewer overflow, fish kill, etc.) All analytical methods are based on standardized protocols or are described in peer reviewed literature.

**Deliverable(s):** The Grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, sample chain of custody and payment records for personnel effort and analytical services 2) A report that characterizes contributions of ground and surface water to Miami River, Little River, and Biscayne Canal. 3) Data in excel format.

**Payment Request Schedule:** Quarterly

*Task 3.3e (Swart): Using Nitrogen Isotopes as Indicators of Pollution Sources*

**Description:**
The stable isotopes of nitrogen measured in submerged aquatic vegetation, organic material, particulate organic material and within the dissolved inorganic nitrogen can, in conjunction with measurements of the concentration of the dissolved organic components, reveal sources of the nitrogen. These sources might include fertilizer and sewage, nitrogen fixation and coastal upwelling. We propose to measure nitrogen isotope within the following components: particulate organic material, dissolved inorganic nitrogen, sediments, and, if present, submerged aquatic vegetation.

Parameters Measured: Organic content, C and N isotopic composition, C/N ratio. The parameters noted above will be sampled during each of five sampling events that will occur at a minimum of 30 sampling sites in the Miami River, a minimum of 15 sampling sites in the Little River, and a minimum of 5 sampling sites in the Biscayne Canal. A minimum of 100 sediment/submerged aquatic vegetation samples will be collected and a minimum of 400 water samples will be collected. Additional sampling efforts may be considered should a special event occur (i.e., extreme weather events, sanitary sewer overflow, fish kill, etc.) All analytical methods are based on standardized protocols or are described in peer reviewed literature.

**Deliverable(s):** The Grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, sample chain of custody and payment records for personnel effort and analytical services 2) A report characterizing the isotopic composition from samples. 3) Data in Excel format.

**Payment Request Schedule:** Quarterly

*Task 3.3f (Olascoaga): Initial Model Data Compilation*

**Description:**
The goal of this project task is to compile existing data needed to characterize the contribution of the Miami River and Inlet Contributing Area (C-6), Little River (C-7), and Biscayne Canal (C-8) as sources of pollution reaching Biscayne Bay. Specific data to be compiled include: bathymetry of the Bay (National Geophysical Data Center); river/canal outflow records, tidal records (NOAA's Lake Worth Pier station, Virginia Key, etc.); existing drifter trajectory records (CARTHE BayDrift); wind records (Data Buoy Center (NDBC) Fowey Rocks station); and any additional physical variable observations (salinity, temperature, currents).

**Deliverable(s):** The grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report of the inventory of the available data 2) an Excel file describing the sources, the available datasets and the method of accessing the information.

**Payment Request Schedule:** Quarterly

*Task 3.3g (Olascoaga): Model Implementation*

**Description:**
The goal of this task is to implement a hydrodynamic model of the circulation in Biscayne Bay. The model of choice is Delf3D Flexible Mesh Suite (Delf3D FM); which includes the widely used hydrodynamic model Delf3D and its recently developed unstructured finite-volume engine, D-Flow Flexible Mesh (D-Flow FM). Based on the primitive equations, Delf3D allows one to simulate the interaction of water, sediment, ecology, and water quality in time and space. The suite is mostly used for the modeling of natural environments like coastal, estuarine, lakes and river areas, but it is equally suitable for more artificial environments like harbors, locks, urban areas, etc. Delf3D consists of a number of well-tested and validated modules, which are linked to

and integrated with each other. The open boundary forcing will be provided by the Hybrid-Coordinate Ocean Model (HyCOM) data-assimilative system, which provides a 3D depiction of the global ocean state while suppling boundary conditions for coastal and regional models; Atmospheric forcing will be taken from in-situ meteorological stations and forecast system re-analyses. We will target a minimal grid spacing of 30 to 50 m which should be suitable to resolve aspects of the near coastal circulation

**Deliverable(s):** The Grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report describing the components of the model completed, supported by payment records for personnel effort and computational services. If appropriate documentation of the acquisition of capital equipment items. 2) A visualization tool will be produced which will enable the user to predict the release and diffusion of a pollutant/water tracer introduced in specific locations in Biscayne Bay.

**Payment Request Schedule:** Quarterly

*Task 3.3h (Olascoaga): Model Validation*

**Description:**
The simulated circulation will be validated using the newly collected data and historical data (in-situ velocity and salinity measurements and trajectories produced by satellite-tracked drifting buoys.)

The in-situ salinity measurements are captured continuously from a small boat using a portable CTD in the three tributaries and associated Biscayne Bay basins and, if needed for model validation, measurements will be taken at ocean outfall locations (Government Cut and Haulover Cut) to determine the horizontal and vertical extents of the freshwater plumes in each case. The in-situ velocity measurements will be concurrently made using a portable Acoustic Doppler Current Profiler (ADCP). The measurements will be taken under different tidal phases during dry and wet seasons. Ideally these measurements will be coordinated with the water quality measurements.

Two types of satellite-connected drifter deployment strategies will be considered. Type-1 strategy will consist in deployments along the northern Biscayne during different tidal phases and varied wind conditions to determine general circulation patterns. Type-2 strategy will target the diffusion from hypothetical pollution sources from specific locations using a dense array of drifters (Miami River, Little River, Biscayne Canal). A minimum of 15 drifters will be deployed. In each case, and to the extent possible, the drifters will be deployed, recovered, and subsequently re-deployed to maximize the sampling. Given the dimensions of the Bay, this effort requires a minimum of one month of boat time for a minimum of four deployments per year are anticipated.

**Deliverable(s):** The Grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field

logs, payment records for personnel effort and analytical services. If appropriate documentation of the acquisition of equipment items. 1) A comprehensive report of the performance of the hydrodynamic model to predict field observations. 2) Electronic data deliverable of model performance.

**Payment Request Schedule:** Quarterly

*Task 3.3i Model Output Analysis*

**Description:**
Once validated, the output from the model will be analyzed using specialized tools from nonlinear dynamics developed by the team members. This management decision support tool will enable users to evaluate how pollution from Miami River, Little River, and Biscayne Canal affects receiving basins in Biscayne Bay.

**Deliverable(s):** The Grantee will submit the following: Quarterly progress reports that will include one or more of the following items: 1) A report describing the components of the management decision support tool completed, supported by payment records for personnel effort and computational services. If appropriate documentation of the acquisition of capital equipment items. 2) Develop a management decision support tool able to predict relative contribution of each pollution source reaching Biscayne Bay. 3) Capacity building – DERM personnel TBA will be trained to carry out simulations on a dedicated high-powered modeling workstation that can be accessed remotely to facilitate ongoing water quality investigations. A workshop will be held to facilitate training of interested stakeholders.

**Payment Request Schedule: Quarterly**

*Task 3.3j (Gidley and Sinigalliano): Assessments of microbial community, pathogens, and DNA source tracking of bacteria in water quality samples.*

**Description:**
Total microbial community metagenomic environmental DNA (eDNA) will be extracted and purified from water samples collected from the Miami River, Little River, Biscayne Canal, extending into Biscayne Bay. Purified eDNA extracts will be analyzed by quantitative PCR (qPCR) for general enterococci (Entero1A assay), human-source Bacteroides (HF183 assay), dog-source Bacteroides (Dog-Bact assay), and bird-source Helicobacter species (GFD assay) according to established and validated MST protocols of EPA method 1611.1, EPA method 1696, and the California Microbial Source Identification Manual. Appropriate sample processing extraction controls, inhibition controls, positive and negative controls, and qPCR quality control and assurance metrics will be utilized as per EPA recommended guidelines in EPA methods 1611.1 and 1696. The parameters noted above will be sampled during each of five sampling events that will occur at a minimum of 30 sampling sites in the Miami River, a minimum of 15 sampling sites in the Little River, and a minimum of 5 sampling sites in the Biscayne Canal. A minimum of 100 sediment samples will be collected and a minimum of.

Additional sampling efforts may be considered should a special event occur (i.e., extreme weather events, sanitary sewer overflow, fish kill, etc.)

**Deliverable(s):** The Grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, payment records for personnel effort and analytical services. 2) A report on relative contributions of host-source specific fecal bacteria to microbial water quality as proxies for relative contributions of septage/sewage and stormwater/terrestrial runoff in the Miami River, Little River, and Biscayne Canals watersheds, characterizing contributions of host-specific fecal bacteria to water quality issues. 3) Data in excel format.

**Payment Request Schedule:** Quarterly

*Task 3.3k (Gidley and Sinigalliano): Analysis of Sediment/Particulate Matter, Microbial, Pathogen Assessments, and Source Tracking.*

**Description:**
Total microbial community metagenomic environmental DNA (eDNA) will be extracted and purified from sediment samples collected from the Miami River, Little River, Biscayne Canal, extending into Biscayne Bay. This eDNA will be analyzed by qPCR-based microbial source tracking as described above for general enterococci, human-source Bacteroides, dog-source Bacteroides, and bird-source Helicobacter, with appropriate controls and EPA recommended QA/QC metrics as described above. The parameters noted above will be sampled during each of five sampling events that will occur at a minimum of 30 sampling sites in the Miami River, a minimum of 15 sampling sites in the Little River, and a minimum of 5 sampling sites in the Biscayne Canal. A minimum of 100 sediment samples will be collected. Additional sampling efforts may be considered should a special event occur (i.e., extreme weather events, sanitary sewer overflow, fish kill, etc.)

**Deliverable(s):** The Grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, payment records for personnel effort and analytical services. 2) A report on a) the role of sediments as potential background environmental reservoirs for land-based sources of microbial pollution, and b) identify the likely origin of such host-specific microbial contamination.
3) Data in excel format.

**Payment Request Schedule:** Quarterly
*Task 3.3l (Gidley and Sinigalliano): Source apportioning and microbial fingerprinting.*

**Description:**
Aliquots of selected samples of the total microbial community metagenomic eDNA extracts already generated from water and sediment for the MST analyses as described above will also be analyzed by 16S ribosomal DNA amplicon sequencing as per the standardized Earth Microbiome Project protocols and the generated sequencing data will be subject to community taxa bioinformatics analysis, as well as bioinformatically analyzed by specific "Source Tracker"

sequencing algorithms and pipelines. This approach can compare user-designated specific "source" microbial population structures with user-designated specific "recipient" or "sink" microbial population structures to determine the relative contributions or influence of specific "source" populations affecting the designated "recipient" populations, thus aiding in which designated sources are potentially having more relative impacts on the designated recipient areas in question. Unlike the qPCR-based MST which targets single specific bacterial taxa, this broader sequencing approach develops a library of microbial population "fingerprints" from potential pollution sources to track relative exposure and influence on designated recipient target areas of interest. In addition, this sequencing data can be screened for the presence of potentially pathogenic bacterial taxa to provide additional independent insight into relative potential exposure risk to public and environmental health. Together, the qPCR-based and sequencing-based MST approaches can synergistically enhance each other, especially for chronic problem areas of LBSP with multiple pollutant input sources. A minimum of 300 microbial DNA extracts will be analyzed in this task. Additional sampling efforts may be considered should a special event occur (i.e., extreme weather events, sanitary sewer overflow, fish kill, etc.) All analytical methods are based on standardized protocols or are described in peer reviewed literature.

**Deliverable(s):** The Grantee will submit: Quarterly progress reports that will include one or more of the following items: 1) A report describing the sequencing completed, supported by payment records for personnel effort and analytical services. 2) A report on microbial population taxonomy in the waters and sediments of the Miami River, Little River, Biscayne Canal watersheds for identification of additional pathogenic microbial taxa. 3) Data in Excel format.

**Payment Request Schedule:** Quarterly

*Task 3.4: Final Report*

**Description:**
A draft synthesis report of all project findings, recommendations and conclusions will be produced and provided as an interim final report for review and comments. All supporting documentation including field records, maps, publications, GIS layers and electronic data deliverables. The draft report will be shared with the FDEP Grant Manager for review and comments. The team will address the comments and provide a final report as the last deliverable for the project.

**Deliverable(s):** The Grantee will submit: 1) A draft synthesis report of all project findings, recommendations and conclusions will be produced and provided as an interim final report for review and comments. 2) All supporting documentation including field records, maps, publications, GIS layers and electronic data deliverables.

**Payment Request Schedule: One time after acceptance of final report.**

## VI. PROJECT TASK TIMELINE:

The tasks must be completed by, and all deliverables received by, the corresponding task end date.

| Task No. | Task Title | Est. Task Start Date | Task End Date | Deliverables | Task Invoice Frequency |
|---|---|---|---|---|---|
| 3.1 | Quality Assurance Project Plan - Draft | 11/1/2021 | 12/31/2021 | Draft QAP in Word format | N/A |
| | Quality Assurance Project Plan - Final | 1/1/2022 | 1/31/2022 | Final QAP in Word format | N/A |
| 3.2 | Reporting | 11/1/2021 | 3/31/2023 | Progress report using Exhibit A in Word format & a budget report in Excel format. | N/A |
| 3.3a | Produce an inventory of water sources contributing to the Miami River, Little River, and Biscayne Canal watersheds based on existing and available datasets. | 1/1/2022 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report of comprehensive characterization of the identified sources including discriminating parameters and variability. 2) Data in excel file or an alternative electronic data deliverable (EDD) format describing the sources, the available datasets and the method of accessing the information. | Quarterly |
| 3.3b | Water Quality Sampling Program | 2/1/2022 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, sample chain of custody and payment records for personnel effort and analytical services. If appropriate documentation of the acquisition of capital equipment items. 2)A report of comprehensive characterization of the identified sources including discriminating parameters and variability. 3) Data in excel format of an alternative electronic data | Quarterly |

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|---|---|---|---|---|---|
| | | | | deliverable (EDD) format. 4) A GIS layer depicting sampling locations. | |
| 3.3c | Characterization of Particulate Material and Sediment Movement | 2/1/2021 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, sample chain of custody and payment records for personnel effort and analytical services. If appropriate documentation of the acquisition of capital equipment items. 2) A report characterizing particulate matter and sediment in Miami River, Little River, and Biscayne Canal. 3) Data in excel format. 4) A GIS layer depicting sampling locations. | Quarterly |
| 3.3d | Relative Contributions of Ground and Surface Water into Miami River, Little River, Biscayne Canal and Environs | 2/1/2021 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, sample chain of custody and payment records for personnel effort and analytical services 2) A report that characterizes contributions of ground and surface water to Miami River, Little River, and Biscayne Canal. 3) Data in excel format. | Quarterly |
| 3.3e | Using Nitrogen Isotopes as Indicators of Pollution Sources | 2/1/2021 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, sample chain of custody and payment records for personnel effort and analytical services 2) A report characterizing the isotopic composition from samples. 3) Data in Excel format. | Quarterly |
| 3.3f | Initial Model Data Compilation | 1/1/2022 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report of the inventory of the available data 2) an Excel file describing the | Quarterly |

| | | | | | |
|---|---|---|---|---|---|
| | | | | sources, the available datasets and the method of accessing the information. | |
| 3.3g | Model Implementation | 2/1/2022 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the components of the model completed, supported by payment records for personnel effort and computational services. If appropriate documentation of the acquisition of capital equipment items. 2) A visualization tool will be produced which will enable the user to predict the release and diffusion of a pollutant/water tracer introduced in specific locations in Biscayne Bay. | Quarterly |
| 3.3h | Model Validation | 6/1/2021 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, payment records for personnel effort and analytical services. If appropriate documentation of the acquisition of equipment items. 1) A comprehensive report of the performance of the hydrodynamic model to predict field observations. 2) Electronic data deliverable of model performance. | Quarterly |
| 3.3i | Model Output Analysis | 6/1/2022 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the components of the management decision support tool completed, supported by payment records for personnel effort and computational services. If appropriate documentation of the acquisition of capital equipment items. 2) Develop a management decision support tool able to predict relative contribution of each pollution source reaching Biscayne Bay. 3) Capacity building – DERM personnel TBA will be trained to carry out simulations on a dedicated high- | Quarterly |

| | | | | | |
|---|---|---|---|---|---|
| | | | | powered modeling workstation that can be accessed remotely to facilitate ongoing water quality investigations. A workshop will be held to facilitate training of interested stakeholders. | |
| 3.3j | Assessments of microbial community, pathogens, and DNA source tracking of bacteria in water quality samples | 2/1/2022 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, payment records for personnel effort and analytical services. 2) A report on relative contributions of host-source specific fecal bacteria to microbial water quality as proxies for relative contributions of septage/sewage and stormwater/terrestrial runoff in the Miami River, Little River, and Biscayne Canals watersheds, characterizing contributions of host-specific fecal bacteria to water quality issues. 3) Data in excel format. | Quarterly |
| 3.3k | Analysis of Sediment/Particulate Matter, Microbial, Pathogen Assessments, and Source Tracking | 2/1/2021 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the fieldwork completed, supported by field logs, payment records for personnel effort and analytical services. 2) A report on a) the role of sediments as potential background environmental reservoirs for land-based sources of microbial pollution, and b) identify the likely origin of such host-specific microbial contamination.<br>3) Data in excel format. | Quarterly |
| 3.3l | Source apportioning and microbial fingerprinting | 2/1/2022 | 12/31/2022 | Quarterly progress reports that will include one or more of the following items: 1) A report describing the sequencing completed, supported by payment records for personnel effort and analytical services. 2) A report on microbial population taxonomy in the waters and sediments of the Miami River, Little River, Biscayne Canal watersheds for | Quarterly |

| | | | | | |
|---|---|---|---|---|---|
| | | | | identification of additional pathogenic microbial taxa. 3) Data in Excel format. | |
| 3.4 | Final Report - Draft | 12/31/2022 | 3/1/2022 | 1) A draft synthesis report of all project findings, recommendations and conclusions will be produced and provided as an interim final report for review and comments. 2) All supporting documentation including field records, maps, publications, GIS layers and electronic data deliverables. | Single payment request following approval of the deliverable |
| | Final Report - Final | 3/1/2023 | 3/31/2023 | A revised final report of all project findings, recommendations and conclusions. | Single payment request following approval of the deliverable |

## VII. BUDGET DETAIL BY TASK:

Fixed cost grant funding must not exceed the budget amounts as indicated below. Match funding shall be provided at the minimum amounts in the categories indicated below.

*{Include the budget category or categories for each task and summarize the respective funding amount. DELETE non-applicable categories and the "Total" if not needed. DELETE Match column if not required. For no grant/no match tasks, add "$0" to indicate either no grant or match funds associated with this task.}*

| Task No. | Task Title | Budget Category | Grant Amount | Match Amount | Task Total |
|---|---|---|---|---|---|
| 3.3a-3.3b (PG) | 3.3a: Produce an inventory of water sources contributing to the Miami River, Little River, and Biscayne Canal watersheds based on existing and available datasets.<br><br>3.3b: Water Quality Sampling Program | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $287,254 | $0 | $287,254 |
| | | Salary | $277,725 | $0 | $277,725 |
| | | Fringe Benefits | $106,998 | $0 | $106,998 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$671,977** | **$0** | **$671,977** |
| 3.3c-3.3e (PS) | 3.3c: Characterization of Particulate Material and Sediment Movement | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $272,603 | $0 | $272,603 |

| | | | | | |
|---|---|---|---|---|---|
| | 3.3d: Relative Contributions of Ground and Surface Water into Miami River, Little River, Biscayne Canal and Environs<br><br>3.3e: Using Nitrogen Isotopes as Indicators of Pollution Sources | Salary | $161,276 | $0 | $161,276 |
| | | Fringe Benefits | $45,681 | $0 | $45,681 |
| | | Equipment | $59,469 | $0 | $59,469 |
| | | **Total for Task:** | **$539,029** | **$0** | **$539,029** |
| 3.3f-3.3i (JO) | 3.3f: Initial Model Data Compilation<br><br>3.3g: Model Implementation<br><br>3.3h: Model Validation<br><br>3.3i: Model Output Analysis | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $38,500 | $0 | $38,500 |
| | | Salary | $255,384 | $0 | $255,384 |
| | | Fringe Benefits | $91,871 | $0 | $91,871 |
| | | Equipment | $15,000 | $0 | $15,000 |
| | | **Total for Task:** | **$400,755** | **$0** | **$400,755** |
| 3.3j-3.3l (MG & CS) | 3.3j: Assessments of microbial community, pathogens, and DNA source tracking of bacteria in water quality samples<br><br>3.3k: Analysis of Sediment/Particulate Matter, Microbial, Pathogen Assessments, and Source Tracking<br>3.3l: Source apportioning and microbial fingerprinting | Contractual Services | $4,094 | $0 | $4,094 |
| | | Miscellaneous/Other Expenses | $33,296 | $0 | $33,296 |
| | | Salary | $165,112 | $0 | $165,112 |
| | | Fringe Benefits | $61,749 | $0 | $61,749 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$264,251** | **$0** | **$264,251** |
| 3.4 | Final Report | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |

| | | | | | |
|---|---|---|---|---|---|
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$0** | **$0** |
| | | **Total for Tasks:** | **$1,876,012** | **$0** | **$1,876,012** |
| | | **Indirect costs as 15%** | **$273,983** | **$0** | **$273,983** |
| | | **Project Total:** | **$2,149,995** | **$0** | **$2,150,000** |

***Include the following under the budget table for all agreements:***

Note: Authorization for continuation and completion of work and any associated payments may be rescinded, with proper notice, at the discretion of the Department if the Legislature reduces or eliminates appropriations.

***All budget items must be tied to deliverable(s) associated with that Task. Line items (rows) may be added for other additional costs (e.g. supplies). If a task cannot be completed and therefore deliverables cannot be submitted the total cost of the contract agreement will be reduced accordingly.***

***Neither publication costs nor conference attendance are eligible for state funding.***

***Indirect Cost can not exceed 15% of the Total Direct Expense***

***TRAVEL: If travel is included and being covered, State of Florida (DEP) Travel Policy Standards and Procedures must be followed. You may be asked to include documentation of travel with the appropriate task's deliverables.***

- Mileage: Only travel over 50 miles (one-way) from the traveler's residence or headquarters can be covered. Reimbursement for use of a personal vehicle is permitted at the established mileage rate of $0.445.
- Lodging: If hotel expenses for travel is $175/night or greater, the traveler must provide justification for approval before traveling. No reimbursement will be considered for Airbnb reservations.
- Per Diem: The full-day rate is $80. This applies only when lodging expenses are not included.
- Meals: Breakfast: $6, Lunch: $11, Dinner: $19 ($36/day). This applies only when lodging expenses are included.

## *VIII.* SALARY AND FRINGE BENEFITS BY TASK: *ADD if salaries/fringe are grant funded or used as match*

Fixed cost funding or match hourly and fringe rate(s) by position may not exceed those indicated below. ***EXAMPLE*** *shown, revise as needed. Include all possible position titles that may be used for the task(s). May list fixed hourly rate and fringe rate.*

| Task No. | Position Title | Hourly Rate | Fringe Rate (%) |
|---|---|---|---|
| 3a-3b (PG) | *Senior Scientist (PI) (PRG)* | $106.86 | 36.13 |
| | *Lead Scientist (PI)* | | |
| | *Scientist (PI)* | | |
| | *Research Associates (post-docs)(TBA)* | $27.13 | 36.13 |
| | *Research Analysts (staff)(TBA)* | $26.74 | 55.80 |
| | *Research Assistants (students) (KT)* | $13.12 | 8.20 |
| **Task No.** | **Position Title** | **Hourly Rate** | **Fringe Rate (%)** |
| 3c-3e (PS) | *Senior Scientist (PI) (PS)* | 139.91 | 28.32% |
| | *Lead Scientist (PI)* | - | - |
| | *Scientist (PI)* | - | - |
| | *Research Associates (post-docs)* | 32.94 | 28.32% |
| | *Research Analysts (staff)* | - | - |
| | *Research Assistants (students)* | - | - |
| | | | |
| 3f-3i (JO) | *Senior Scientist (PI)* | 84.11 | 28.32% |
| | *Lead Scientist (PI)* | 84.58 | 28.32% |
| | *Research Analysts (staff)* | 29.28 | 42.43% |
| | *Research Associates (post-docs)* | - | - |
| | *Research Analysts (staff)* | 29.28 | 42.43% |
| | *Research Assistants (students)* | - | - |
| | | | |
| 3j-3l (MG, CS) | *Senior Scientist (PI)* | 34.07 | 42.43% |
| | *Lead Scientist (PI)* | - | - |
| | *Scientist (PI)* | 33.80 | 42.43% |
| | *Research Analysts (staff)* | 21.47 | 42.43% |

| | | | |
|---|---|---|---|
| | *Research Assistants (students)* | 9.88 | - |
| | *Research Assistants (students)* | 9.74 | - |
| | | | |
| 3.4 | *Senior Scientist (PI)* | 0 | 0 |
| | *Lead Scientist (PI)* | 0 | 0 |
| | *Scientist (PI)* | 0 | 0 |
| | *Research Associates (post-docs)* | 0 | 0 |
| | *Research Analysts (staff)* | 0 | 0 |
| | *Research Assistants (students)* | 0 | 0 |

***Include the following under the salary and fringe budget table for all agreements:***

Note: Upon submission of each payment request, the Grantee certifies that the hours and rates submitted are accurate and allowable costs for the grant agreement. Upon request by the Department's grant manager, additional documentation of hours worked will be provided.

DRAFT

# TASK 4: Innovative Technology

**L REEF PROTECTION AND RESTORATION (CPR) GRANT**
**WORK PLAN**
**DEP CPR GRANT AGREEMENT NO. C2001**

**I. PROJECT TITLE:** Biscayne Bay Water Quality Characterization and Pollution Reduction, Miami Dade County (MDC) - ***Sanitary Sewer Overflow Prediction and Prevention Pilot Plan (SSOP4)***

**II. PROJECT LOCATION(S):** The Project will primarily focus on the C6 and C7 Stormwater Basins within Miami-Dade County. However, the project area may include wastewater collection basins that extend beyond C6 and C7, but have hydraulic influence within the C6 and C7 basins.

**III. PROJECT BACKGROUND:**

This project will directly support immediate and short-term recommendations identified in the Biscayne Bay Task Force Report, to improve water quality and address the health of Biscayne Bay. This project includes the development and implementation of a *Sanitary Sewer Overflow Prediction and Prevention Pilot Plan (SSOP4)* designed to evaluate the effectiveness of a Virtual Inspector and Dashboard protocol to minimize sanitary sewer overflows and thereby improve water quality and the health of Biscayne Bay.

An effective *Sanitary Sewer Overflow Prediction and Prevention Plan* would provide the following benefits:

1. Provide early warning of conditions in the wastewater collection system (WCS) that could lead to a sanitary sewer overflow (SSO),
2. If an SSO occurs, providing quicker response to minimize the magnitude of the SSO,
3. Improve coordination with utilities and system operators by making key data available to them which can be used for WCS improvements to reduce SSOs,
4. Provide WCS operation data that can be used to evaluate system performance under peak flow conditions related to normal diurnal patterns, tidal patterns, and dry and wet weather inflow and infiltration. This data can be used to evaluate WCS improvements that may be implemented to minimize the potential for SSOs, and
5. Provide data for enforcement actions required to cause system and operational improvements to minimize SSOs.

There will be other direct and indirect benefits, all with the main objective of minimizing SSOs and thereby improving the health of the Biscayne Bay.

The Water and Wastewater Division (W&WD) is responsible for the regulatory oversight of private and public sanitary sewer systems totaling more than three thousand (3,000) sanitary sewer basins spanning sixteen (16) public utilities and more than one thousand (1,000) private sanitary sewer systems that connect to the public systems. The public systems include Miami-Dade County Water and Sewer Department (WASD) and fifteen (15) Municipal Utilities.

The public sanitary sewer system includes regional and sub-regional systems for collection, transmission and treatment (refer to ***Figure 1***).

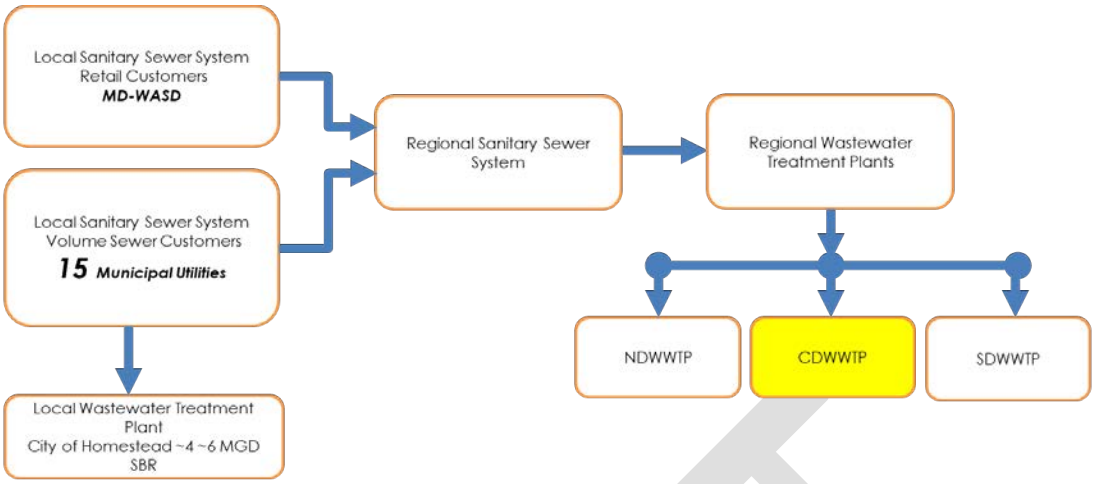


**Figure 1**

The prime objective of the W&WD is to minimize the occurrence of SSOs and this is accomplished using a multi-tiered approach that includes:

1. Sewer System Design Review and Approval
2. Operating Permits
3. Operational Monitoring
4. Facility Inspections
5. SSO Response & Evaluations
6. SSO Enforcement

While the existing approach addresses most preventive maintenance criteria, it does not include an effective Preventative Diagnostics function. Additionally, most of the data collected or received is after-the-fact data. That is, it is not effective in "Predicting" an SSO in a manner that can allow for a timely preventative response. The ***SSOP4*** is designed to evaluate the use of remote monitoring to minimize sanitary sewer overflows.

To fully implement this program and more effectively address SSOs, the following positions have been added to the W&WD:

| Position Title | Full Time Equivalents |
|---|---|
| Engineer 3 | 1 |
| Engineer 2 | 3 |
| Pollution Control Inspector 1 | 1 |
| Environmental Technician 2 | 5 |

## IV. PROJECT DESCRIPTION:

The pilot project will provide for the design, implementation, monitoring and evaluation of the ***SSOP4*** to augment the multi-tiered approach with the goal of minimizing SSOs. The W&WD will consult with DEP staff throughout development of the SSOP4, especially as it relates to site selection.

The ***SSOP4*** will be designed to deploy real-time Hydraulic Grade Line Monitoring (HGLM) at key Wastewater Collection System (WCS) nodes as follows:

1. ***Key WCS Manholes***. These are locations which have a history of SSOs or serve as early detection points for major collection and conveyance systems which are located within hydraulic proximity of significant surface water bodies or where SSOs can impact water bodies. The real-time HGLM sensor is deployed to continuously measure the hydraulic level in the key manhole and will alert the W&WD when a preset elevation is reached. The alert is transmitted in email and text forms to smart phones and through a digital dashboard. This "Predictive" function allows the W&WD staff to take actions to minimize or prevent an SSO.

   The selection of Key WCS Manholes will be guided by the following:

   a. Gravity Sanitary Sewer System Nodes (manholes).
   b. Impacted Resources/Basins.
   c. Historical SSO location and frequency (refer to ***Figure 2***).
   d. Ground elevation data (refer to LiDAR map, ***Figure 3***).
   e. Stormwater Systems (Note: may include storm water manholes) & Surface Waters.
   f. Sanitary Sewer Basin Moratoriums.
   g. Citizen Complaints.
   h. Input from SSOP4 Technical Advisory Group (TAG) made up of volunteers from the Utility Round Table (utilities, engineers, and manufactures), DERM staff, and DEP. DERM staff will include:
      a. Oscar Aguirre, EI
      b. Galo Pacheco, PE
      c. Carlos L. Hernandez, PE
      d. Support staff

2. ***Key Pump Stations***. These are pump stations which have a history of SSOs or surcharging WCS and thereby causing SSOs. The real-time HGLM sensor is deployed in the pump station's 1st manhole (immediately hydraulically up-gradient of the pump stations) and serves to continuously measure the hydraulic level in the manhole and will alert the W&WD when a preset elevation is reached. The alert is transmitted in email and text forms to smart phones and through a digital dashboard. This "Predictive" function allows the W&WD staff to take actions to minimize or prevent and SSO.

3. ***Enforcement Manholes***: While less proactive than above, this approach includes placing an HGLM sensor in a manhole as part of an effective enforcement strategy for facilities that have experienced chronic SSOs and may be under Department enforcement. This provides real-time enforcement monitoring to minimize or prevent additional SSOs and confirm corrective action measures imposed by the Department are being successfully implemented and maintained. The HGLM sensor will alert the W&WD when a preset elevation is reached. The alert is transmitted in email and text forms to smart phones and through a digital dashboard. This "Predictive" function allows the W&WD staff to take actions to minimize or prevent and SSO.

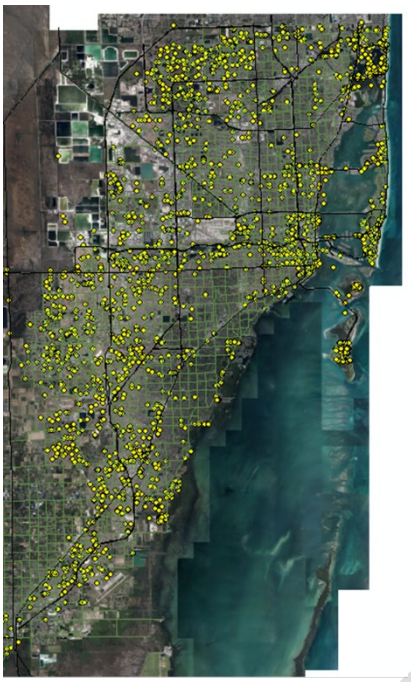

*Figure 2 - Historical SSO Locations*

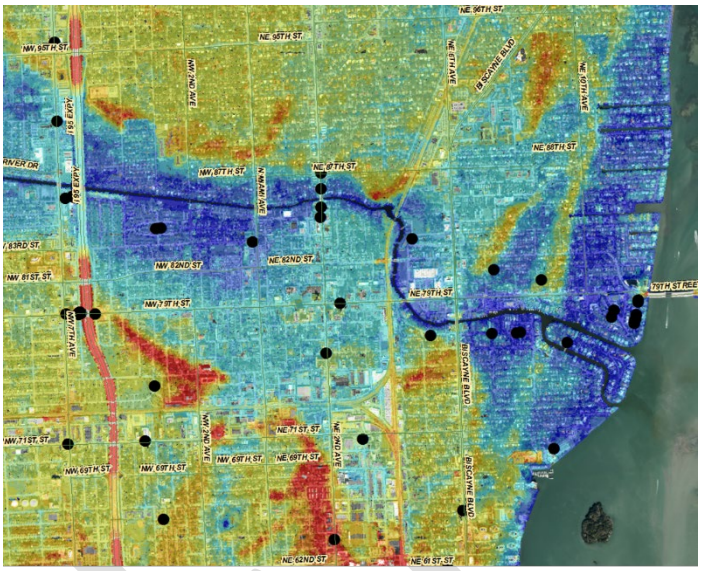

*Figure 3 - Ground Elevation Data*

The following actions will be taken by W&WD staff for all HGLM sensor locations described above:

1. Alert Notification. These notifications are triggered when the wastewater level reaches the "alert" level. Alert levels will typically be set at or above the pipe crown, but not typically greater than 12-inches above the crown (depending on system depth; e.g., terminal manhole versus manhole near pump station). For pump stations, the lowest influent pipe will be used to set the alert level. Staff will monitor these alerts for trends and may require utilities to take corrective actions or submit an action plan to address surcharge conditions.
2. Alarm Notification. These notifications are triggered when the wastewater level reaches the "alarm" level. Alarm levels will typically be set at 24-inches below the manhole rim elevation. For pump stations, the level will typically be set at 48-inches below the hatch elevation. Staff will notify utilities of all alarm notifications so that immediate actions can be taken to avoid - or minimize the impact of an SSO. For first-time alarm notifications, the W&WD staff may inspect the system. When there are more than two alarm notifications within a month, staff will inspect the system and review system data (e.g., elapsed time readings, yearly nominal daily average pump station operating time, etc.) to evaluate root cause and may require the utility to take additional corrective actions or submit an action plan to address surcharge conditions.
3. If an SSO occurs before a utility can respond to an alarm notification (to prevent an SSO), staff will notify utility and inspect the location of the SSO to minimize the impact to facilities, public health and the environment. Staff will issue appropriate notice(s) to order the utility to take all actions required to stop the SSO and minimize impacts. Existing standard operating procedures for SSOs, including but not limited to: repairs, recovery of waste/wastewater, disinfection, notifications, and posting of warning signs will be followed pursuant to Chapter 24 and Standard Operating Agreement with DEP. The W&WD will review all available data to determine the root

cause of the SSO and review notification settings, utility coordination, and other procedures to minimize or prevent the reoccurrence of an SSO.

4. Each month staff will review notification data to evaluate system performance and identify potential improvements that may be implemented to minimize future SSOs.
5. Where applicable, notification data will be used to supplement enforcement actions required to cause system and operational improvements that can reduce the occurrence or minimize the magnitude of SSOs.

The total project cost is $1,150,000 of which $1,150,000 is from DEP and $0 is from Miami-Dade County.

## V. TASKS:

**Funding Acknowledgement:** All deliverables, presentations, and social media posts will acknowledge the financial assistance provided by Florida Department of Environmental Protection– Coral Protection and Restoration Program.

**Performance Standard for All Tasks:** The Department's Grant Manager will review the task deliverable to verify that the deliverable has been completed as described per task section. Upon review and written acceptance by the Department's Grant Manager, the Grantee may proceed with payment request submittal.

All deliverables shall be submitted electronically unless otherwise indicated. All permit(s) must be acquired prior to work starting (if required). All raw data acquired for this project must be submitted to DEP at the end of the project. All final deliverable(s) must comply with Section 508 of the U.S. Rehabilitation Act (as amended), Florida Statute Chapter 282, and Florida Administrative Code (FAC) Rule: 60-8.002.

The contractor must notify DEP when data from this project will be presented or published. Any maps, graphics, charts, or other deliverables intended to visually communicate information should include the following: title and/or appropriate explanation of the visual being presented, consistent scale bar, north arrow and key, and clearly labeled county lines (if applicable). When submitting photo deliverables, a consistent naming convention and organizational structure will be used that includes the date, site name, and any other relevant information. A separate folder will also be created with a smaller subset of photos (5-15 total) that highlight the overall project and can be used for communication pieces and/or messaging. All final deliverables and invoice(s) will be submitted to DEP by the end of this agreement or earlier. DEP may take up to two weeks to review deliverables.

**The SSOP4 will be performed for a period of no less than twelve (12) months and will generally include the following tasks:**

***4.1 Quality Assurance Project Plan***

***4.2 Reporting***

***4.3 Innovative Technology***

4.3a Pilot Equipment Procurement & Training
4.3b Pilot Effectiveness Analysis, Review and Recommendations

While these tasks are sequential, there will be an integral loop-back function built into all tasks to allow for refinement, revision or realignment of tasks as information is obtained and data analyzed.

**Task 4.1: Quality Assurance (QA) Project Plan – Draft and Final**

**Description:** The Grantee will prepare a Quality Assurance Project Plan (QAPP) for any monitoring data collected and/or analyzed. The QAPP must be approved by the Department prior to commencement of any monitoring or research associated with the project. The Grantee will use the format provided by the Department's Grant Manager (see Exhibit D – Quality Assurance Requirements).

**Deliverable(s):** The Grantee will submit a draft Quality Assurance Project Plan in Word format and a Final Quality Assurance Project Plan in Word format. The following lists the expected deliverables that are associated with the quality assurance requirements of this Grant:

a. An initial planning review technical audit as specified in Section 5.b.i. of Exhibit D shall be completed by the Grantee after the second completed sampling and analysis event, but no later than the fourth. The Grantee shall submit a report of this initial planning review audit within one month of the review, and that report shall include a statement of usability as described in Section 5.b.iii. of Exhibit D.

(i) For research analytes only, when reporting grant field or analytical research results, the Grantee shall submit statements about data usability per Section 8 of Exhibit D.

b. Ongoing planning review technical audits shall be conducted annually thereafter for the remainder of the Grant, if applicable to the duration of the Grant, as described in Section 5.b.ii. of Exhibit D. The Grantee shall submit a report of each annual planning review audit with a statement of usability (Section 5.b.iii), within one month of the review.

c. The Grantee shall submit the Grant Quality Assurance Plan (QA Plan) as described in Section 6 of Exhibit D to the DEP Grant Manager no later than 30 days prior to the commencement of field and laboratory activities. Failure to submit the QA Plan in this required timeframe shall result in a delay of approval to begin work until the document has been submitted to the Department and approved (or conditionally approved) by the DEP Grant Manager.

(i) The Grantee may submit a version of the QA Plan to the Department for approval no more than three times. If the Grantee fails to obtain approval for the QA Plan after the third (final) submission to the Department, the DEP Grant Manager may suspend or terminate the Grant per the remedies included in the Grant.

(ii) Within 30 days of receipt of the QA Plan by the Department, the Department shall review and either approve the QA Plan or provide comments to the Grantee as to why the QA Plan is not approved. If further revisions are needed, the Grantee shall then have 30 days from the receipt of review comments to respond. The Department shall respond to all revisions to the QA Plan within 30 days of receipt of any revisions.

(iii) If the review of the QA Plan by the Department is delayed beyond sixty (60) days after the QA Plan is received by the Department, through no fault of the Grantee, the Grantee shall have the option, after the QA Plan is approved, of requesting an extension in the term of the Grant for a time not to exceed the period of delayed review and approval. This option must be exercised at least sixty (60) days prior to the current termination date of the Grant. The Department shall then determine whether the request for an extension is allowed.

(iv) If any significant changes in sampling project design, changes in the project analyte list, changes in procedures or test methods, changes in equipment, or changes in key personnel occur, the Grantee shall submit appropriate revisions of the QA Plan to the DEP Grant Manager for review in writing. The proposed revisions may not be implemented until they have been approved (or conditionally approved) by the DEP Grant Manager. If the Grantee fails to submit the required revisions, the DEP Grant Manager may suspend or terminate the Grant per the remedies included in the Grant.

**Payment Request Schedule:** N/A

**Task 4.2: Reporting**

**Description:** The Grantee will provide a progress and budget report quarterly per Exhibit A. The progress report will summarize the work completed within each task for the reporting period. It will also provide an update on the estimated completion date for each task and an explanation for any anticipated delays or problems encountered.

**Deliverable(s):** The Grantee will submit quarterly: 1) a progress report using Exhibit A in Word format and 2) a budget report in Excel format.

**Payment Request Schedule:** N/A

**Task 4.3: Innovative Technology**

*Task 4.3a: Pilot Equipment Procurement & Training*

**Description:** The Grantee will procure all equipment needed to implement the SSOP4, including 207 HGLM sensors and fifteen (15) virtual rain gauge sensors. During this task, all SSOP4 staff will be trained by SMARTCOVER or their representative to use and monitor procured equipment. Training will consist of hands-on virtual training and in-field training. Virtual training will include four (4) sessions, each being four (4) hours long. Field training will consist of four sessions, each being four (4) hours long. Training will be coordinated with system setup and installation. The exact location and distribution of the 207 HGLM sensors and fifteen (15) virtual rain gauge sensors will be determined as described in the PROJECT DESCRIPTION above.

**Deliverable(s):** The Grantee will submit 1) invoices for all equipment procured, 2) electronic copies of all training materials used to train SSOP4 staff, and 3) copies of training completion certificates for staff.

**Payment Request Schedule:** The Grantee may submit a payment request after the deliverable is received and approved, and will not be submitted more frequently than quarterly.

*Task 4.3b: Pilot Effectiveness Analysis, Review and Recommendations*

**Description:** The Grantee will review/analyze all data collected, including Key Performance Indicators (KPIs), to evaluate the effectiveness of the pilot to minimize SSOs and make recommendations for future deployment/work.

**Deliverable(s):** The Grantee will submit a (draft and final) report that includes the following:

- Summary of all data acquired/collected.
- Summary of findings, including:
    - Pilot Design & Key Performance Indicators
    - Dashboard/Network Configuration
    - HGLM Sensor Deployment
    - Dashboard Monitoring, Data Evaluation and "Predictive" Analysis
    - Field Inspections: Routine & Alert/Alarm
- Review of all data acquired/collected.
- Review of SSOs for the zones monitored and zones not monitored, both compared to historical data and trends.

- Data/KPI analysis.
- Charts/Tables/Figures.
- Management and Next Step Recommendations.

**Payment Request Schedule:** N/A

## VI. PROJECT TASK TIMELINE:

The tasks must be completed by, and all deliverables received by, the corresponding task end date.

| Task No. | Task Title | Est. Task Start Date | Task End Date | Deliverables | Task Invoice Frequency |
|---|---|---|---|---|---|
| 4.1 | Quality Assurance Project Plan - Draft | 12/01/2021 | 12/30/2021 | Draft Quality Assurance Project Plan in Word format | N/A |
| | Quality Assurance Project Plan - Final | 12/01/2021 | 01/31/2022 | Final Quality Assurance Project Plan in Word and PDF format | N/A |
| 4.2 | Reporting | 01/31/22 | 03/31/2023 | Progress report using Exhibit A in Word format & a budget report in Excel format. | N/A |
| 4.3a | Pilot Equipment Procurement & Training | 12/01/2021 | 03/31/2022 | Invoices for all equipment procured, electronic copies of all training materials used to train SSOP4 staff, and copies of training completion certificates for staff. | Quarterly |
| 4.3b | Pilot Effectiveness Analysis, Review and Recommendations | 1/1/2023 | 02/31/2023 | Draft Report | N/A |
| | Pilot Effectiveness Analysis, Review and Recommendations | 1/1/2023 | 03/31/2023 | Final Report | N/A |

## VII. BUDGET DETAIL BY TASK:

Fixed cost grant funding must not exceed the budget amounts as indicated below. Match funding shall be provided at the minimum amounts in the categories indicated below.

| Task No. | Task Title | Budget Category | Grant Amount | Match Amount | Task Total |
|---|---|---|---|---|---|
| 4.1 | Quality Assurance Project Plan | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| **Total for Task:** | | | **$0** | **$0** | **$0** |
| 4.2 | Reporting | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |

| | | | | | |
|---|---|---|---|---|---|
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$0** | **$0** |
| 4.3a | Pilot Equipment Procurement & Training | Contractual Services | $1,150,000.00 | $0 | $1,150,000.00 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | $1,150,000.00 | **$0** | $1,150,000.00 |
| 4.3b | Pilot Effectiveness Analysis, Review and Recommendations | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$0** | **$0** |
| | | **Project Total:** | $1,150,000.00 | **$** | $1,150,000.00 |

**SALARY AND FRINGE BENEFITS BY TASK:** ***ADD if salaries/fringe are grant funded or used as match***

Fixed cost funding or match hourly and fringe rate(s) by position may not exceed those indicated below. ***EXAMPLE*** *shown, revise as needed. Include all possible position titles that may be used for the task(s). May list fixed hourly rate and fringe rate.*

| Task No. | Position Title | Hourly Rate | Fringe Rate (%) |
|---|---|---|---|
| 1 | *Engineer III* | *$* | *%* |
| | *Environmental Specialist I* | *$* | *%* |
| | *Associate Environmental Specialist* | *$* | *%* |
| | *Engineering Technician I* | *$* | *%* |
| | | | |
| 2 | *Engineer III* | *$* | *%* |
| | *Environmental Specialist I* | *$* | *%* |
| | *Associate Environmental Specialist* | *$* | *%* |
| | *Engineering Technician I* | *$* | *%* |
| | | | |
| 3 | *Engineer III* | *$* | *%* |
| | *Environmental Specialist I* | *$* | *%* |
| | *Associate Environmental Specialist* | *$* | *%* |
| | *Engineering Technician I* | *$* | *%* |
| | | | |
| 4 | *Engineer III* | *$* | *%* |
| | *Environmental Specialist I* | *$* | *%* |
| | *Associate Environmental Specialist* | *$* | *%* |

| | | | |
|---|---|---|---|
| | *Engineering Technician I* | *$* | *%* |
| | | | |

Note: Authorization for continuation and completion of work and any associated payments may be rescinded, with proper notice, at the discretion of the Department if the Legislature reduces or eliminates appropriations.

**DRAFT**

# TASK 5: Education and Outreach

**CORAL REEF PROTECTION AND RESTORATION (CPR) GRANT**
**WORK PLAN**
**DEP CPR GRANT AGREEMENT NO. C2001**

**I. PROJECT TITLE:** Biscayne Bay Water Quality Characterization and Pollution Reduction, Miami Dade County (MDC) – **Connect to Protect Outreach Campaign**

**II. PROJECT LOCATION(S):** The Project will be located in Miami-Dade County. Initial efforts will primarily focus within the Miami River and Little River basins.

## III. PROJECT BACKGROUND:

This project will directly support immediate and short-term recommendations identified in the Biscayne Bay Task Force Report, to improve water quality and address the health of Biscayne Bay. This project includes the development of an outreach and engagement campaign for programs to convert septic to sewer and the promotion of proper septic system care. This project will be delivered in coordination with the "Connect to Protect" septic to sewer conversion project and the "Check to Protect" program to promote and incentivize the proper care of maintenance systems with a primary focus in the Little River Adaptation Action Area (LRAAA) planning boundary, which includes areas of the City of Miami, El Portal, and unincorporated Miami-Dade County. There are approximately 1,650 parcels currently served by septic systems within the LRAAA, which is a low to moderate income community.

Much of the area is low-lying and prone to flooding especially along the banks of the Little River and the coastal areas. Residents report that septic systems are failing during heavy rain and high tide events, which has resulted in sewage backing up into homes and the ponding of floodwater on lawns and roadways. Some residents cannot occupy their homes during flood events due to failed plumbing.

In addition, nutrient pollution from the Little River waterway was one of the contributors to unprecedented fish kills in Biscayne Bay in 2020. The conversion of septic to sewer and proper maintenance of systems reduces contributions of nutrients and bacteria to surface waters and stormwater, therefore reducing water pollution in Biscayne Bay.

## IV. PROJECT DESCRIPTION:

The project will provide education and outreach to residents in the LRAAA to raise awareness of the benefits of converting from septic systems to the sanitary sewer system, encourage and incentivize the proper care of septic systems, and provide implementation support for the Septic to Sewer Conversions Project in the LRAAA. This effort will serve as an important testing of messaging and tools for sharing in other areas where septic systems are vulnerable to compromise or failure and may contribute nutrients and pathogens to ground and surface waters.

A media campaign will be developed and implemented with two main themes, Connect to Protect and Check to Protect, focused on septic to sewer conversions and proper septic system care, respectively. In addition to raising awareness this project will provide public involvement assistance in the delivery of the Septic Conversions project workplan, which includes the connection of properties to the sanitary sewer system and incentivizing proper septic system maintenance through a rebate program. The goal of the project is to build a shared understanding of the benefits addressing septic systems can have on private property, public health, and our natural systems, including Biscayne Bay, and to encourage the timely implementation of conversions delivered through the Septic Conversions project.

The total project cost is $500,000 of which $500,000 is from DEP. A summary of any local contributions will be required in the Final Quarterly Progress Report, and financial supporting documentation shall be provided upon request.

## V. TASKS:

**Funding Acknowledgement:** All deliverables, presentations, and social media posts will acknowledge the financial assistance provided by the State of Florida, as administered by the Office of Resilience and Coastal Protection's – Coral Protection and Restoration Program, within the Florida Department of Environmental Protection.

**Performance Standard for All Tasks:** The Department's Grant Manager will review the task deliverable to verify that the deliverable has been completed as described per task section. Upon review and written acceptance by the Department's Grant Manager, the Grantee may proceed with payment request submittal.

All deliverables shall be submitted electronically unless otherwise indicated. All permit(s) must be acquired prior to work starting (if required). All raw data acquired for this project must be submitted to DEP at the end of the project. All final deliverable(s) must comply with Section 508 of the U.S. Rehabilitation Act (as amended), Florida Statute Chapter 282, and Florida Administrative Code (FAC) Rule: 60-8.002.

The contractor must notify DEP when data from this project will be presented or published. Any maps, graphics, charts, or other deliverables intended to visually communicate information should include the following: title and/or appropriate explanation of the visual being presented, consistent scale bar, north arrow and key, and clearly labeled county lines (if applicable). When submitting photo deliverables, a consistent naming convention and organizational structure will be used that includes the date, site name, and any other relevant information. A separate folder will also be created with a smaller subset of photos (5-15 total) that highlight the overall project and can be used for communication pieces and/or messaging. All final deliverables and invoice(s) will be submitted to DEP by the end of this agreement or earlier. DEP may take up to two weeks to review deliverables.

**Task 5.1: Quality Assurance (QA) Project Plan**

**Description:** This Task does not require a QA plan as no environmental, scientific data will be collected.
**Deliverable(s):** N/A
**Payment Request Schedule:** N/A

**Task 5.2: Reporting**

**Description:** The Grantee will provide a progress and budget report quarterly per Exhibit A. The progress report will summarize the work completed within each task for the reporting period. It will also provide an update on the estimated completion date for each task and an explanation for any anticipated delays or problems encountered.

**Deliverable(s):** The Grantee will submit: 1) a progress report using Exhibit A in Word format and 2) a budget report in Excel format.

**Payment Request Schedule:** N/A

**Task 5.3: Education and Outreach**

*Task 5.3a: Connect to Protect and Check to Protect Marketing*

**Description:**
The grantee will develop a comprehensive septic to sewer campaign with uniform messaging styles that are recognizable as an implementing strategy of the recommendations established in the Biscayne Bay Task Force Report. The two main messages will be for the Connect to Protect and Check to Protect Programs focused on septic to sewer conversions and proper septic system care, respectively. The Connect to Protect program will allow homeowners to retire their septic systems and connect to the wastewater system. The goal of the plan is to build a shared understanding of the benefits addressing septic systems can have on private property, public health, and our natural systems including Biscayne Bay.

Specific activities include development of campaign branded creative concepts and identifiers, implementation of a media marketing plan including digital and print advertisements, short informational videos, surveys, data analysis for program planning and performance tracking, website enhancements, and other message delivery mechanisms. These efforts will focus primarily on the Little River Adaptation Action Area, which includes approximately 1,650 parcels. Approximately 370 parcels will be targeted for septic to sewer conversions, with the remaining to be engaged regarding the benefits of connection and the County's broader Connect to Protect program. These efforts will include marketing of the Check to Protect Program and the availability of rebates for septic system inspections and maintenance activities. While the majority of the effort will be focused on the Little River Area, the marketing tools will be delivered to the broader target audience of the 120,000 properties served by septic systems countywide.

**Deliverable(s):** The Grantee will submit the following:

- Media Plan to include digital, social, print, and outdoor media buys (quantities to be specified in the media plan, which will be developed using demographic research to establish effective outreach delivery mechanisms on a zip code basis).
- A minimum of two short 2-minute informational videos/animations.
- A minimum of two websites (Connect to Protect and Check to Protect) that include digital public engagement components that allow for surveying, registrations, and supporting data analysis.
- Media Plan implementation report including quantities and performance measures.
- Marketing services to develop online engagement and program management tools

**Payment Request Schedule:** The Grantee may submit a payment request quarterly following approval of the deliverable.

*Task 5.3b: Connect to Protect Public Involvement*

**Description:**
The grantee will acquire professional services to develop a Public Involvement Plan and conduct implementation tasks for community outreach and engagement efforts for the Connect to Protect and Check to Protect Programs focused on septic to sewer conversions and proper septic system care, respectively. The firm will lead engagement activities and serve as the liaison for implementation projects including septic to sewer conversion projects. The firm will conduct a grassroots campaign to include an array of engagement activities including organizing and leading public workshops; presenting virtually and in person at community events; conducting field assessments; identification, and creation of a database of stakeholders affected including homeowners, businesses, schools, county commission offices, and municipal partners affected by design and construction; door to door public outreach including distribution

of informational handouts; one-on-one coordination with affected property owners; coordination of agreements and forms; management of online surveys and data analysis; use of social media to keep residents and businesses informed and up to date on project progress; creation, design, and graphics development of project-related informational materials as needed; attendance at construction meetings; handling of all project inquiries from the community and creation of a log to include types of issues/timeframe to resolve and resolution information; preparation of quarterly activity reports; coordinating outreach efforts led by other stakeholders including other Miami-Dade County departments and municipalities; and coordination of the permitting required for property owners.

**Deliverables:** The Grantee will submit the following:

- Public Involvement Plan including the following minimum components:
  - A minimum of 2 project fact sheets.
  - Development of property owner mailing list.
  - Door to door advisories in the project are comprised of more than 300 homes.
  - Project database and issues log.
  - A minimum of 4 community information sessions.
  - Providing assistance to property owners in securing permits, agreements, and facilitating private side connections
- Quarterly Activities Report
- Public Involvement Plan implementation report including quantities and performance measures

**Payment Request Schedule:** The Grantee may submit a payment request quarterly following approval of the deliverable.



## VI. PROJECT TASK TIMELINE:

The tasks must be completed by, and all deliverables received by, the corresponding task end date.

| Task No. | Task Title | Est. Task Start Date | Task End Date | Deliverables | Task Invoice Frequency |
|---|---|---|---|---|---|
| 5.1 | Quality Assurance Project Plan | N/A | N/A | N/A | N/A |
| 5.2 | Reporting | 01/31/22 | 03/31/2023 | Progress report using Exhibit A in Word format & a budget report in Excel format | N/A |
| 5.3a | Connect to Protect and Check to Protect Marketing | 12/01/2021 | 03/31/2023 | •Media Plan to include digital, social, print, and outdoor media buys (quantities to be specified in the media plan<br>•A minimum of two2-minute informational videos/animations<br>•A minimum of two websites that include digital public engagement components<br>•Media Plan implementation report including quantities and performance measures<br>Branded marketing materials and online engagement tool | Quarterly |
| 5.3b | Connect to Protect Public Involvement | 12/01/2021 | 03/31/2023 | • Public Involvement Plan including the following minimum components:<br>o A minimum of 2 project fact sheets<br>o Development of property owner mailing list | Quarterly |

| | | | | | |
|---|---|---|---|---|---|
| | | | | o Door to door advisories in the project are comprised of more than 300 homes<br>o Project database and issues log<br>o A minimum of 4 community information sessions<br>• Quarterly Activities Report<br>• Public Involvement Plan implementation report including quantities and performance measures | |

## VII. BUDGET DETAIL BY TASK:

Fixed cost grant funding must not exceed the budget amounts as indicated below. Match funding shall be provided at the minimum amounts in the categories indicated below.

| Task No. | Task Title | Budget Category | Grant Amount | Match Amount | Task Total |
|---|---|---|---|---|---|
| 5.1 | Quality Assurance Plan | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$0** | **$0** |
| 5.2 | Reporting | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$0** | **$0** |
| 5.3a | Connect to Protect and Check to Protect Marketing | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $275,000 | $0 | $275,000 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $ |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$200,00** | **$0** | **$200,00** |
| 5.3b | Connect to Protect Public Involvement | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $225,000 | $0 | $225,000 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$300,000** | **$0** | **$300,000** |
| | | **Project Total:** | **$500,000** | **$0** | $500,000 |

Note: Authorization for continuation and completion of work and any associated payments may be rescinded, with proper notice, at the discretion of the Department if the Legislature reduces or eliminates appropriations.

**DRAFT**

# TASK 6: Septic to Sewer Conversions

**CORAL REEF PROTECTION AND RESTORATION (CPR) GRANT**
**WORK PLAN**
**DEP CPR GRANT AGREEMENT NO. C2001**

**I. PROJECT TITLE:** Biscayne Bay Water Quality Characterization and Pollution Reduction, Miami Dade County (MDC) – **Septic to Sewer Conversions**

**II. PROJECT LOCATION(S):** The Project will be located in Miami-Dade County. Initial efforts will primarily focus within the Little River basin.

**III. PROJECT BACKGROUND:**

This project will directly support immediate and short-term recommendations identified in the Biscayne Bay Task Force Report, to improve water quality and address the health of Biscayne Bay. This project addresses septic systems in the Little River basin. The project will provide sanitary sewer system service to properties currently served by septic systems. The project will result in the removal of septic systems that are vulnerable to rising groundwater that can cause compromised treatment levels and failures resulting in sewer backups into properties, posing risks to public health, the environment and private properties.

**IV. PROJECT DESCRIPTION:**

This project includes the connection of parcels with abutting sewer infrastructure and expanding sewer service to connect unserved parcels in the Little River Adaptation Action Area (LRAAA). The project includes the installation of public laterals, construction of a wastewater pump station and gravity mains, plumbing of private parcels, the removal of septic systems, associated roadway work, and other activities associated with the septic to sewer conversions. Specifically, the project will result in the connection of approximately 41 homes along an existing gravity main and approximately 330 parcels in a low-lying area vulnerable to the impacts of rising groundwater. The project also includes providing rebates for property owners who obtain septic care services as a way of incentivizing proper care and maintenance of the remaining septic systems within the LRAAA and other areas vulnerable to rising groundwater, which will not undergo conversion through this project.

The total project cost is $19,048,814 of which $4,400,000 is from DEP and $14,648,814 is from Miami-Dade County. A summary of the local contributions will be required in the Final Quarterly Progress Report, and financial supporting documentation shall be provided upon request.

**V. TASKS:**

**Funding Acknowledgement:** All deliverables, presentations, and social media posts will acknowledge the financial assistance provided by the Florida Department of Environmental Protection's Coral Protection and Restoration Program.

**Performance Standard for All Tasks:** The Department's Grant Manager will review the task deliverable to verify that the deliverable has been completed as described per task section. Upon review and written acceptance by the Department's Grant Manager, the Grantee may proceed with payment request submittal.

All deliverables shall be submitted electronically unless otherwise indicated. All permit(s) must be acquired prior to work starting (if required). All raw data acquired for this project must be submitted to DEP at the

end of the project. All final deliverable(s) must comply with Section 508 of the U.S. Rehabilitation Act (as amended), Florida Statute Chapter 282, and Florida Administrative Code (FAC) Rule: 60-8.002.

The contractor must notify DEP when data from this project will be presented or published. Any maps, graphics, charts, or other deliverables intended to visually communicate information should include the following: title and/or appropriate explanation of the visual being presented, consistent scale bar, north arrow and key, and clearly labeled county lines (if applicable). When submitting photo deliverables, a consistent naming convention and organizational structure will be used that includes the date, site name, and any other relevant information. A separate folder will also be created with a smaller subset of photos (5-15 total) that highlight the overall project and can be used for communication pieces and/or messaging. All final deliverables and invoice(s) will be submitted to DEP by the end of this agreement or earlier. DEP may take up to two weeks to review deliverables.

**Task 6.1: Quality Assurance (QA) Project Plan**

**Description:** This Task does not require a QA plan as no environmental, scientific data will be collected.
**Deliverable(s):** N/A
**Payment Request Schedule:** N/A

**Task 6.2: Reporting**

**Description:** The Grantee will provide a progress and budget report quarterly per Exhibit A. The progress report will summarize the work completed within each task for the reporting period. It will also provide an update on the estimated completion date for each task and an explanation for any anticipated delays or problems encountered.

The quarterly report will include the number of properties connected during that period and the associated nutrient reductions anticipated per year based on the removal of the septic systems. The methodology for calculating the nutrient reduction will be reviewed and approved by the Grant Manager.

**Deliverable(s):** The Grantee will submit: 1) a progress report using Exhibit A in Word format and 2) a budget report in Excel format.

**Payment Request Schedule:** N/A

**Task 6.3: Septic to Sewer Conversions**

*Task 6.3a: Engineering Evaluation and Design Services*

**Description:** The Grantee will acquire professional services for the engineering and design of the project including the development of engineering design plans and technical specifications, as well as support for the bidding phase and regulatory requirements.

Specific activities include inspections of the site to verify existing conditions, considerations from the performance of site survey, analysis of existing utility locations, review of geotechnical investigations, assess horizontal alignment considerations, incorporation of material selections, and confirmations from the design criteria upon which the project is to be based. Engineering design services will also include regulatory coordination support that includes pre-application meetings with the permitting agencies having jurisdiction on this project, the provision of signed and sealed drawings, and obtaining all required permits.

**Deliverable(s):** The Grantee will submit Certification of Completion including documentation of submittal affirming that the final design document was completed and submitted to the Department.

**Payment Request Schedule:** N/A – Match Funding

*Task 6.3b: Construction*

**Description:** The Grantee will acquire professional services for the construction of the pump station, collection and transmission lines, and public sewer laterals to serve up to 370 properties. Activities also include the associated road and right-of-way work to complete the installation of the infrastructure.

**Deliverable(s):** The Grantee will submit Certification of Completion by a Florida-registered Professional Engineer with documentation of submittal to the Department affirming the construction task was completed in accordance with construction contract documents.

**Payment Request Schedule:** N/A – Match Funding

*Task 6.3c: Private Property Connections*

**Descriptions:** Task 6.3c.1: Private Plumbing and Removal of Septic Systems
The Grantee will connect a minimum of 200 (out of a targeted to the sanitary sewer system. Services include pump-out and abandonment, establishing private plumbing connections, obtaining sewer capacity certification, applying for sewer connection, and inspections.

An application will be used for the enrollment of private property owners for the execution of private side connections by the Grantee. Enrollment of applicants will primarily be based on economic need as defined by properties located within areas designated as economically disadvantaged. Once all economically disadvantaged properties are connected and reimbursed, funds may be used to connect properties that adjacent to surface waters and that modeled groundwater levels indicate are at an imminent risk of compromise or failure.

Task 6.3c.2: Permitting and Connection Fees
The Grantee, through a contracted outreach firm and/or staff, will coordinate obtaining the necessary permits and payment of the required fees on behalf of the property owners. The firm will coordinate with County departments as well as the Florida Department of Health.

**Deliverable(s):**

Task 6.3c.1: Private Plumbing and Removal of Septic Systems
The Grantee will submit the following:

- Applications for funding assistance for a minimum of 200 property owners out of a targeted 370 properties.
- Certification of work completed and invoices for a minimum of 200 property owners out of a targeted 370 properties

Task 6.3c.2: Permitting and Connection Fees
The Grantee will submit copies of approved permits and fee payments for a minimum of 200 property owners out of a targeted 370 properties.

**Payment Request Schedule:** The Grantee may submit a payment request quarterly following approval of the deliverable.

*Task 6.3d: Septic Care Rebates*

**Description:** The Grantee will establish a Septic Care Rebate Program to provide one rebate per household up to $150 for septic care services including the inspection and any repairs or clean outs. Rebate issuance will be based on meeting minimum qualifications modeled after the existing Miami-Dade Water and Sewer Department high-efficiency water fixture rebate program including:

- Indication of applicant's intent to connect in the event of sewer service availability.
- Original sales receipt/invoice showing payment in full for septic maintenance service.
- Work performed by liquid waste haulers licensed and registered with Miami-Dade County's Department of Regulatory and Economic Resources.

**Deliverable(s):** The Grantee will submit the following:

- Copies of the approved rebate applications and backup documentation for a minimum of 200 properties out of 500 targeted properties.
- Proof of reimbursement payment to property owner for a minimum of 200 properties out of 500 targeted properties.

**Payment Request Schedule:** The Grantee may submit a payment request quarterly following approval of the deliverable.

## VI. PROJECT TASK TIMELINE:

The tasks must be completed by, and all deliverables received by, the corresponding task end date.

| Task No. | Task Title | Est. Task Start Date | Task End Date | Deliverables | Task Invoice Frequency |
|---|---|---|---|---|---|
| 6.1 | Quality Assurance Project Plan | N/A | N/A | N/A | N/A |
| 6.2 | Reporting | 01/31/22 | 03/31/2023 | Progress report using Exhibit A in Word format & a budget report in Excel format. | N/A |
| 6.3a | Engineering Evaluation and Design Services | 10/01/2021 | 03/31/2022 | Certification of Completion | N/A |
| 6.3b | Construction | 01/01/2022 | 02/31/2023 | Certification of Completion | N/A |
| 6.3c | Private Property Connections | 04/01/2022 | 03/31/2023 | Task 6.c.1:<br>1) Applications for funding assistance for a a minimum of 200 property owners out of a targeted 370 properties.<br>2) Certification of work completed and invoices for a minimum of 200 property owners out of a targeted 370 properties | Quarterly |

| | | | | | |
|---|---|---|---|---|---|
| | | | | Task 6.c.2:<br>1) Copies of approved permits and fee payments for a minimum of 200 property owners up to a targeted 370 properties | |
| 6.3d | Septic Care Rebates | 01/01/2021 | 02/31/2023 | 1) Copies of the approved rebate applications and backup documentation for a minimum of 200 properties up to 500 targeted properties<br>2) Proof of reimbursement payment to property owner for a minimum of 200 properties up to 500 targeted properties | Quarterly |

## VII. BUDGET DETAIL BY TASK:

Fixed cost grant funding must not exceed the budget amounts as indicated below. Match funding shall be provided at the minimum amounts in the categories indicated below.

| Task No. | Task Title | Budget Category | Grant Amount | Match Amount | Task Total |
|---|---|---|---|---|---|
| 6.1 | Quality Assurance Plan | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$0** | **$0** |
| 6.2 | Reporting | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$0** | **$0** |
| 6.3a | Engineering Evaluation and Design Services | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$0** | **$0** |
| 6.3b | Construction | Contractual Services | $0 | $14,648,814 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |

| | | | | | |
|---|---|---|---|---|---|
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$14,648,814** | **$0** |
| 6.3c | Private Property Connections | Contractual Services | $4,325,000 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$4,325,000** | **$0** | **$0** |
| 6.3d | Septic Care Rebates | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $75,000 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$75,000** | **$0** | **$0** |
| | | **Project Total:** | **$4,400,000** | **$14,648,814** | **$19,048,8149** |

Note: Authorization for continuation and completion of work and any associated payments may be rescinded, with proper notice, at the discretion of the Department if the Legislature reduces or eliminates appropriations.

**DRAFT**

# TASK 7: Stormwater Treatment

**CORAL REEF PROTECTION AND RESTORATION (CPR) GRANT**
**WORK PLAN**
**DEP CPR GRANT AGREEMENT NO. C2001**

**I. PROJECT TITLE:** Biscayne Bay Water Quality Characterization and Pollution Reduction, Miami Dade County (MDC) - **Stormwater Pilot Project at Three Locations in the Little River Basin (C-7 Basin)**

**II. PROJECT LOCATION(S):** The pilot project will be implemented at three locations in Miami-Dade County:

Location 1: NW 111 STREET TO NW 107 STREET FROM NW 21 COURT TO NW 17 AVENUE

Location 2: NW 96 STREET TO 93 TERRACE FROM NW 17 AVENUE TO NW 14 AVENUE

Location 3: NW 85 STREET TO NW 82 STREET FROM FROM NW 2 AVENUE TO N. MIAMI AVENUE

## III. PROJECT BACKGROUND:

This project will build on recommendations from the Miami-Dade County Stormwater Master Plan and the Resilience Adaptation Area report to design and implement engineering strategies in priority areas, including innovative tools such as application of new technologies, Green Infrastructure (GI) and Low Impact Development (LID) strategies, with the goal of improving the hydrologic functions and the mitigation of surface water quality impacts.

Technical support and findings will be made available to city and county officials in Miami-Dade County to provide information and technical assistance to promote and accelerate implementation of new technologies, GI and LID to reduce, mitigate, and to the greatest extent possible, eliminate land-based sources of pollution.

The County conducted research on technologies currently available that can be used to reduce the pollutant discharges to Biscayne Bay including Total Nitrogen (TN), Total Phosphorus (TP) and Bacteria. Furthermore, the County has conducted water quality assessments to determine pre-installation conditions and target system locations for the application of new technologies for the mitigation of water quality impacts and to implement specific system and infrastructure improvements. Based on the research conducted and the assessment of the pollutant discharges to Biscayne Bay needing mitigation, the decision was to utilize new technology applications and test their effectiveness as part of the pilot project at the three locations identified.

The County has identified, evaluated, and selected site specific technologies that can be successfully implemented as part of a stormwater pilot project to be implemented at three different locations. The identification of the most suitable technologies selected was based on applicability and intended outcome, effectiveness, durability, maintenance, and cost. The

recommended three locations for the pilot project are based on results from a previously completed engineering water quality assessment in the Little River sub-basin, and in support of recommendations from the Biscayne Bay Task Force. This pre-installation assessment will be used to monitor and document the operational performance of each nutrient removal technology installed during storm events, monitor, and document the level of effort required for maintenance, and determine the amount of nutrients and bacteria removed by each type of technology. Selection has also been based on balancing the effectiveness of improving water quality while maintaining the flood quantity level of service.

**IV. PROJECT DESCRIPTION:** This project will include the creation of a QA Plan.

**The total project cost is $1,536,000 of which $1,300,000 is from DEP and $236,000 is from Miami-Dade County**, funded by Stormwater Utility Fee revenue. A summary of the local contributions will be provided in the Final Quarterly Progress Report, and financial supporting documentation shall be provided upon request.

Miami-Dade County conducted a Water Quality Assessment in the Little River Basin. The signed and sealed report by the County consultant Wood Environmental & Infrastructure Solutions, Inc., as finalized and approved, is dated July 6, 2021. Specific locations were chosen based on the Little River Basin Water Quality Assessment Report. The report provides test results related to TN, TP, and bacteria levels throughout the Little River Canal (C-7). In addition, to aid the selection process, staff examined information about the drainage basin, including infrastructure and flow data. The selected pilot locations include stormwater drainage systems serving the public right-of-way: a residential area with outfalls, an arterial road with outfalls, and a residential area discharging through a stormwater pump station. All pilot locations discharge to the C-7. The technologies that have been selected for implementation are considered the best fit for each of the three sites identified.

- Pilot Project Location 1 is located on a residential area in Miami Dade County bounded by NW 111 Street to the North, NW 107 Street to the South, between NW 21 Ct and NW 17 Avenue. Two drainage sub-basins were identified, each one connected to an outfall. The existing drainage infrastructure for Sub-Basin 1 consists of 63 drainage structures and 5,509 LF of solid pipes connected to a pollution control structure with a baffle prior to discharging to the C-7 Canal and the drainage area is 8.5 Acres. The existing drainage infrastructure for Sub-Basin 2 consists of 19 drainage structures and 1,088 LF of solid pipes connected to a pollution control structure with a baffle prior to discharging to the C-7 Canal and the drainage area is 5.95 Acres. These basins do not have stormwater water quality treatment prior to discharge and are in areas being serviced by septic tanks. For this location, the technologies selected for each drainage basin include the use of the StormBasin Filter and the EcoVault unit. The StormBasin is a catch basin insert filter that captures and treats stormwater pollutants commonly found in runoff from parking lots or alongside roadways, such as: trash, vegetation, sediment, debris, nutrients, coliform bacteria, oil/grease, and dissolved metals (e.g., lead, copper, cadmium, and chromium). The system uses preassembled proprietary cartridge filters that can be customized for targeted pollutants. The large sediment and debris chamber provides ample storage volume for solids carried in stormwater flows and its design includes a

hooded bypass to reduce the potential for flooding during peak storm events while still retaining sediment and debris. The EcoVault is a baffle box stormwater multi-stage system that provides separation, screening, and filtration. The EcoVault will remove sediments, heavy metals, nitrogen, phosphorous, oil, and grease by the integration of the Baffle Buddy Cassette Filter, which is a high-flow filter integrated into the last baffle wall of the EcoVault. Maintenance servicing for the StormBasin and EcoVault can be achieved using a vactor truck. Filters can be accessed manually for servicing.

- Pilot Project Location 2 is located on an arterial roadway in Miami Dade County bounded by NW 96 Street to the North, NW 93 Terrace to the South, between NW 17 Avenue and NW 14 Avenue. Two drainage sub-basins were identified, each one connected to an outfall. These sub-basins do not currently have stormwater water quality treatment prior to discharge. The existing drainage infrastructure for Sub-Basin 1 consists of 14 drainage structures and 960 LF of pipes connected to an outfall discharging to the C-7 Canal and the drainage area is 3 Acres. The existing drainage infrastructure for Sub-Basin 2 consists of 13 drainage structures and 1,010 LF of pipes connected to an outfall discharging to the C-7 Canal. The drainage area is 3.5 Acres. These basins have stormwater water quality treatment with 2,400 LF of French drains prior to discharge. This project is in an area being serviced by septic tanks. For this location, the technologies selected for each drainage basin include the use of Hydro DryScreen and Abtech (UFF insert w/smart sponge media). The AbTech's UUF inserts with Smart Pak are designed for use in new or existing stormwater structures that experience hydrocarbon, heavy metal pollution accompanied by sediment, debris, or bacteria. The Hydro DryScreen is a next-generation baffle box that captures sediment and screens trash and other solids from stormwater, storing organic materials such as leaf litter dry to prevent nutrients from leaching into surface water runoff between storm events. Maintenance servicing for the UUF inserts and Hydro DryScreen can be achieved using a vactor truck. Filters can be accessed manually for servicing.

- Pilot Project Location 3 is located on a residential area in Miami Dade County bounded by NW 85 Street to the North, NW 82 Street to the South, between NW 2 Avenue t and N. Miami Avenue. Two drainage sub-basins were identified, both discharge to the C-7 Canal through the Larchmont Pump Station. The existing drainage infrastructure for Sub-Basin 1 consists of 43 drainage structures and 2,100 LF of French drains and the drainage area is 5.1 Acres. The existing drainage infrastructure for Sub-Basin 2 consists of 38 drainage structures and 2450 LF of French drains and the drainage area is 5.05 Acres. As described above, these basins currently have minimal stormwater water quality treatment prior to discharge and are in an area being serviced by septic tanks. For this location, the pilot project selected for each drainage basin include the use of the Contech JellyFish and SOP Technologies Stormwater Filter Baskets. The Jellyfish Filter is a stormwater quality treatment technology featuring high flow pretreatment and membrane filtration in a compact stand-alone system. Jellyfish removes floatable, trash, oil, debris, TSS, fine silt-sized particles, and a high percentage of particulate-bound pollutants, including phosphorus, nitrogen, metals, and hydrocarbons. The SOP Technologies filter baskets are placed under existing storm grates and are designed for maximum water flow. In addition, SOP Technologies storm drains offer markers with Quick Response (QR)

codes, and an associated web app to provide an easy way for community members to share photos and their observations of storm drain filters & inlets. The QR feature offers a way to engage the community in learning about Miami-Dade County's efforts to protect Biscayne Bay. Maintenance servicing for the SOP inserts and Jellyfish can be achieved using a vactor truck. Filters can be accessed manually for servicing.

The duration for the pilot project will be approximately one and a half years, including implementation, maintenance cycle(s) and post-installation water quality assessment to evaluate the effectiveness and technology performance. Results of the implementation of the pilot project at the three locations are expected to provide information needed for future use of new technologies for removing nutrients from the stormwater drainage systems discharging to the Little River and other Biscayne Bay tributaries and increase the understanding of which solutions work best and under which scenarios. Results will ultimately be used to assist with the evaluation of the cost-benefit analysis of implementing different stormwater nutrient removal technologies for stormwater drainage systems discharging into waterbodies of Miami Dade County. In addition, results of this pilot project can be used to establish and refine policies, that will encourage private developers to implement new technologies in private projects to further mitigate impacts to the health of Biscayne Bay.

## V. TASKS:

**Funding Acknowledgement:** All deliverables, presentations, and social media posts will acknowledge the financial assistance provided by the Florida Department of Environmental Protection's Coral Protection and Restoration Program.

**Peformance Standard For All Tasks:** The Department's Grant Manager will review the task deliverable to verify that the deliverable has been completed as described per task section. Upon review and written acceptance by the Department's Grant Manager, the Grantee may proceed with payment request submittal.

All deliverables shall be submitted electronically unless otherwise indicated. All permit(s) must be acquired prior to work starting (if required). All raw data acquired for this project must be submitted to DEP at the end of the project. All final deliverable(s) must comply with Section 508 of the U.S. Rehabilitation Act (as amended), Florida Statute Chapter 282, and Florida Administrative Code (FAC) Rule: 60-8.002.

The contractor must notify DEP when data from this project will be presented or published. Any maps, graphics, charts, or other deliverables intended to visually communicate information should include the following: title and/or appropriate explanation of the visual being presented, consistent scale bar, north arrow and key, and clearly labeled county lines (if applicable). When submitting photo deliverables, a consistent naming convention and organizational structure will be used that includes the date, site name, and any other relevant information. A separate folder will also be created with a smaller subset of photos (5-15 total) that highlight the overall project and can be used for communication pieces and/or messaging.

All final deliverables and invoice(s) will be submitted to DEP by March 31, 2023 or earlier. DEP may take up to two weeks to review deliverables.

Each task is detailed below:

**Task 7.1: Quality Assurance Project Plan – Draft and Final**

**Description:** The Grantee will prepare a Quality Assurance Project Plan (QAPP). The QAPP must be approved by the Department prior to commencement of any monitoring or research associated with the project. The QAPP must specify all key processes/information required for the execution of the work. The Grantee will use the format provided by the Department's Grant Manager (see Exhibit D – Quality Assurance Requirements). This task is to be performed by Grantee.

**Research QA Exhibit found in Exhibit D:**

The following lists the expected deliverables that are associated with the quality assurance requirements of this Grant:

1. When reporting grant field or analytical research results, the Grantee shall submit statements about data usability per Section 8 of **Exhibit D**.
2. The Grantee shall submit the Grant QA Plan as described in Section 9 of **Exhibit D** to the DEP Grant Manager no later than 30 days ***prior to the commencement of field and laboratory activities***. Failure to submit the QA Plan in this required timeframe shall result in a delay of approval to begin work until the document has been submitted to the Department and approved (or conditionally approved) by the DEP Grant Manager.

a. The Grantee may submit a version of the QA Plan to the Department for approval no more than three times. If the Grantee fails to obtain approval for the QA Plan after the third (final) submission to the Department, the DEP Grant Manager may suspend or terminate the Grant per the remedies included in the Grant.
b. Within 30 days of receipt of the QA Plan by the Department, the Department shall review and either approve the QA Plan or provide comments to the Grantee as to why the QA Plan is not approved. If further revisions are needed, the Grantee shall then have 15 days from the receipt of review comments to respond. The Department shall respond to all revisions to the QA Plan within 15 days of receipt of any revisions.
c. If the review of the QA Plan by the Department is delayed beyond sixty (60) days after the QA Plan is received by the Department, through no fault of the Grantee, the Grantee shall have the option, after the QA Plan is approved, of requesting an extension in the term of the Grant for a time not to exceed the period of delayed review and approval. This option must be exercised at least sixty (60) days prior to the current termination date of the Grant. The Department shall then determine whether the request for an extension is allowed.
d. If any significant changes in sampling project design, changes in the project analyte list, changes in procedures or test methods, changes in equipment, or changes in key personnel occur, the Grantee shall submit appropriate revisions of the QA Plan to the DEP Grant Manager for review in writing. The proposed revisions may not be implemented until they have been approved (or conditionally approved) by the DEP Grant Manager. If the Grantee fails to submit the required revisions, the DEP Grant Manager may suspend or terminate the Grant per the remedies included in the Grant.

**Deliverable(s):** The grantee will submit a draft Quality Assurance Project Plan in Word format and a Final Quality Assurance Project Plan in Word and PDF format.

**Payment Request Schedule:** The Grantee will submit a single payment request following approval of the deliverable(s).

**Task 7.2: Reporting**

**Description:** The Grantee will provide a progress and budget report quarterly per Exhibit A. The progress report will summarize the work completed within each task for the reporting period. It will also provide an update on the estimated completion date for each task and an explanation for any anticipated delays or problems encountered. A quarterly budget update will also be included with the progress report. This task is to be performed by Grantee.

**Deliverable(s):** The Grantee will submit: 1) a progress report using Exhibit A in Word format and 2) a budget report in Excel format.

**Payment Request Schedule:** N/A

**Task 7.3: Stormwater Treatment**

*Task 7.3a: Survey, Design & Permitting*

**Description:** The Grantee will conduct field survey work for the three pilot project locations detailed above; prepare design/signed and sealed construction drawings and technical specifications; and procure all applicable permits. Applicable permits are anticipated to be Class II permit(s) as issued by Miami-Dade County. This task is to be performed by Grantee.

**Deliverable(s):** The Grantee will submit: 1) signed and sealed construction drawings, and 2) approved permit documentation.

**Payment Request Schedule:** The Grantee will submit a single payment request following approval of the deliverable(s).

*Task 7.3b: Bid, Award, Construction, Construction Inspections & Contract Reconciliation Report*

**Description:** The Grantee will prepare for and bid/award construction contract for installing repective technology within the three pilot project locations detailed above; implement construction contract; inspect construction contract; and prepare a final contract reconciliation report. This task is to be performed via contracted resources.

**Deliverable(s):** The Grantee will submit: 1) a contract reconciliation report.

**Payment Request Schedule:** The Grantee will submit a single payment request following approval of the deliverable(s).

*Task 7.3c: Maintenance, Monitoring, Sampling, Testing & Reporting*

**Description:** The Grantee will conduct infrastructure maintenance activities as needed within the three pilot project locations detailed above; monitor and sample the infrastructure to measure effectiveness of improvements compared to pre- water assessment report; test samples; repeat the maintenance, monitoring and sampling cycles as needed (e.g., collecting enough samples to draw statistically robust conclusions) to be able to provide a significant technical opinion of the effectiveness of the improvements implemented; prepare final signed and sealed report with results and technical engineering conlusions. Minimum number of sampling locations, methodology, and other sampling details to follow the approved **Quality Assurance Project Plan**. This task is to be performed via contracted resources.

A minimum of 34 water samples will be collected from each of the 3 sampling locations for the Little River Basin project. The sampling locations included three separate designated areas: downgradient (Part 1), central gradient (Part 2), and upgradient (Part 3). The sampling order will begin at the downgradient locations and proceeded to the upgradient locations. This sampling protocol will be guided by the directional flow of the Little River and to ensure that representative water samples will be obtained.

Water samples will be collected within 48 hours of a rain event and at low tide, when possible. Water quality sampling was performed pursuant to the FDEP Standard Operating Procedures (SOP) for Field Activities (DEP-SOP-001/01) dated January 2017. Samples will be collected from the extendable grab sampler and transferred to the appropriate sample containers, sealed, and immediately stored in an ice-filled cooler and delivered within the appropriate hold time under chain-of-custody to Pace Analytical Services LLC, a State of Florida certified laboratory, for analysis. During the collection of the water samples, field parameters were obtained including, pH, temperature, specific conductance, turbidity, ORP, and dissolved oxygen. Each sampling location was inspected for possible potential sources, which may contribute to high concentrations of bacteriological and nutrient pollution.

Methods for laboratory analysis of bacteriological parameters of the water samples include, Escherichia Coli by Method SM 9223B and Enterococci by Method Enterolet/Quantitray. The analysis of nutrient parameters will include, Nitrogen, Ammonia by EPA Method 350.1, Total Kjeldahl Nitrogen by EPA Method 351.2, Nitrogen, Nitrite, and Nitrate by EPA Method 353.2, Orthophosphate as P by EPA Method 365.1, and Phosphorous by EPA Method 365.4.

**Deliverable(s):** The Grantee will submit: 1) signed and sealed assessment report and technical conclusions on the effectiveness of the improvements, and 2) monitoring and sampling data and metadata in origin files (ex: Excel).

**Payment Request Schedule:** The Grantee will submit a single payment request following approval of the deliverable(s).

*Task 7.3d: Final Project Closeout Executive Report*

**Description:** The Grantee will prepare a final project closeout report summarizing all project (task) actions, data, and results including recommendations for future efforts. This task is to be performed by Grantee.

**Deliverable(s):** The Grantee will submit: 1) technical project closeout executive report.

**Payment Request Schedule:** The Grantee will submit a single payment request following approval of the deliverable(s).

## VI. PROJECT TASK TIMELINE:

The tasks must be completed by, and all deliverables received by, the corresponding task end date.

| Task No. | Task Title | Est. Task Start Date | Task End Date | Deliverables | Task Invoice Frequency *(Single, Monthly, Annually, Specific Dates, etc.)* |
|---|---|---|---|---|---|
| 1 | Quality Assurance Project Plan - Draft | 1/01/2022 | 01/31/2022 | Draft QAPP in Word format | One time, upon task completion |
| | Quality Assurance Project Plan - Final | 02/01/2022 | 2/31/2022 | Final QAPP in Word and PDF format | |
| 2 | Reporting | 1/1/2021 | 03/31/2023 | Progress report using Exhibit A in Word format & a budget report in Excel format. | One time, upon task completion |
| 7a | Survey, Design & Permitting | 2/01/2021 | 02/28/2022 | Signed and Sealed Construction Drawings and Approved Permit Documentation | One time, upon task completion |
| 7b | Bid, Award, Construction, Construction Inspections & Contract Reconciliation Report | 03/01/2022 | 01/31/2023 | Contract Reconciliation Report | One time, upon task completion |
| 7c | Maintenance, Monitoring, Sampling, Testing & Reporting | 09/01/2022 | 03/31/2023 | Signed and Sealed Assessment Report | One time, upon task completion |
| 7d | Final Project Closeout Executive Report | 01/01/2023 | 03/31/2023 | Technical Project Closeout Executive Report | One time, upon task completion |

## VII. BUDGET DETAIL BY TASK:

Fixed cost grant funding must not exceed the budget amounts as indicated below. Match funding shall be provided at the minimum amounts in the categories indicated below.

| Task No. | Task Title | Budget Category | Grant Amount | Match Amount | Task Total |
|---|---|---|---|---|---|
| 1 | Quality Assurance Project Plan – Draft and Final | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $6,000 | $6,000 |
| | | Fringe Benefits | $0 | $4,000 | $4,000 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$10,000** | **$10,000** |
| 2 | Reporting | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $12,000 | $12,000 |
| | | Fringe Benefits | $0 | $9,000 | $9,000 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$21,000** | **$21,000** |
| 7a | Survey, Design & Permitting | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $110,000 | $110,000 |
| | | Fringe Benefits | $0 | $85,000 | $85,000 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$195,000** | **$195,000** |
| 7b | Bid, Award, Construction, Construction Inspections & Contract Reconciliation Report | Contractual Services | $1,000,000 | $0 | $1,000,000 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$1,000,000** | **$0** | **$1,000,000** |
| 7c | Maintenance, Monitoring, Sampling, Testing & Reporting | Contractual Services | $300,000 | $0 | $300,000 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$300,000** | **$0** | **$300,000** |
| 7d | Final Project Closeout Executive Report | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $6,000 | $6,000 |
| | | Fringe Benefits | $0 | $4,000 | $4,000 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$10,000** | **$10,000** |
| **Project Total** | | **$** | **$1,300,000** | **$236,000** | **$1,536,000** |
| | | **%** | **85%** | **15%** | |

Note: Authorization for continuation and completion of work and any associated payments may be rescinded, with proper notice, at the discretion of the Department if the Legislature reduces or eliminates appropriations.

**SALARY AND FRINGE BENEFITS BY TASK:** Fixed cost funding or match hourly and fringe rate(s) by position may not exceed those indicated below.

| Task No. | Position Title | Hourly Rate | Fringe Rate (%) |
|---|---|---|---|
| 1 | *Senior Professional Engineer* | *$68* | *78%* |
| | *Drafting Specialist* | *$32* | *78%* |
| | | | |
| 2 | *Senior Professional Enginner* | *$68* | *78%* |
| | *Manager RER Environmental Section* | *$59* | *78%* |
| | *Environmental Resource Project Supervisor* | *$65* | *78%* |
| | | | |
| 3 | *Senior Professional Engineer* | *$68* | *78%* |
| | *Engineer 3* | *$62* | *78%* |
| | *Engineer 2* | *$52* | *78%* |
| | *Cadastral Technician* | *$32* | *78%* |
| | | | |
| 6 | *Senior Professional Engineer* | *$68* | *78%* |
| | *Environnmental Resource Supervisor* | *$65* | *78%* |
| | *Flood Plain Program Supervisor* | *$45* | *78%* |
| | *Drafting Specialist* | *$32* | *78%* |
| | | | |

Note: Upon submission of each payment request, the Grantee certifies that the hours and rates submitted are accurate and allowable costs for the grant agreement. Upon request by the Department's grant manager, additional documentation of hours worked will be provided.

**DRAFT**

# TASK 8: Biological Restoration to Enhance Water Quality

**CORAL REEF PROTECTION AND RESTORATION (CPR) GRANT**
**WORK PLAN**
**FDEP CPR GRANT AGREEMENT NO. C2001**

**I. PROJECT TITLE:** Biscayne Bay Water Quality Characterization and Pollution Reduction, Miami Dade County (MDC)

**II. PROJECT LOCATION(S):** The Project will be located in Unincorporated Miami-Dade County within Miami-Dade County, portions of City of Miami

**III. PROJECT BACKGROUND:**

Living Shorelines Guidance Document

There are regulations and policies that exist to protect Biscayne Bay- including the Biscayne Bay Aquatic Preserves and Biscayne National Park- from dredging and filling tidal waters and thereby impacting and/or preempting seagrass or hardbottom habitat by way of the creation of what are regarded as living shorelines. It is understood, however, that a living shoreline (e.g., appropriately sloped mangroves/mangrove planters, marsh grasses, etc.) may be preferable to a hardened shoreline (e.g., bulkhead, seawall, sheetpile, etc.) for many reasons including but not limited to the idea that living shorelines may allow shorelines to shift and tides to ebb and flow in response to sea level rise; buffer wave energy from storms in a way that may cause less turbidity from waves reverberating off vertical structures; provide enhanced ecological value; water quality improvement; and other benefits. A balance must be struck between living shorelines providing the same or better integrity and efficacy of hardened options in terms of protecting property and minimizing impacts to natural resources. Miami-Dade County has conducted dozens of living shorelines projects across Biscayne Bay since the 1980s on publicly owned lands. In the recent past, the perception of rules, regulations, and policies guiding the development of living shorelines being onerous and limiting for both property owners and public entities has deterred interested parties from pursuing living shorelines and instead motivating public and private entities to petition for changes to both the Biscayne Bay Aquatic Preserve Act, Chapter 24 of the Code of Miami-Dade County, and other regulations meant to guide dredging and filling activities and other development within Biscayne Bay. The goal of the project is to review existing rules, regulations, and policies at the municipal, county, state and federal levels and identify potential nature-based solutions and designs that could be employed by both private and public landowners.

Sponge Nursery to Enhance Filtration of Bay Waters

To enhance water quality filtration and species restoration in Northern Biscayne Bay, the County will partner with Department of Environmental Protection (DEP) including the Biscayne Bay Aquatic Preserves (BBAP), Florida Sea Grant Miami-Dade County Extension, and will seek consulting services to pilot sponge propagation methodology testing and associated water quality monitoring. The proposed host site lies within the Venetian Basin on state-owned sovereignty submerged lands where pilings and concrete slabs were placed around 100 years ago for a failed island building project. Prior research on nutrient loading and distribution throughout Northern BBAP shows a significant increase in eutrophication and chlorophyll-a within the environment, contributing to the ongoing seagrass die-off and recent fish kills. A pilot sponge propagation project focusing on the potential filtration benefits will contribute existing knowledge on water quality restoration and improvements and the region's knowledge on sponge propagation, attachment, and growth success, as a whole.

## IV. PROJECT DESCRIPTION:

Living Shorelines Guidance Document

To achieve the goal of ultimately creating a Living Shorelines Guidance Document, the County would contract an engineer to conduct the aforementioned regulatory review and develop draft designs/plans that fall within the bounds of existing rules and regulations. Additionally, terms commonly used but for which there are yet to be agreed upon definitions will be defined. These terms include defining what a living shoreline is/consists of; defining resilience and what a resilience project may consist of and benefits demonstrated; outlining the importance of seagrass and hardbottom habitat and how these habitats, if preempted, are lost via filling activities and replaced by habitat that can be restored by using, at least in part, portions of the upland; and why creation of certain types of habitat or using certain species may not be successful (e.g., attempting to create oyster habitat where other hardbottom or seagrass habitat has historically occurred). The County will procure the services of an engineer to accomplish this portion of this endeavor and will partner with community organizations to assist in workshopping the draft document before an audience comprised of the regulated public, consultants and contractors, agency staff at the municipal, county, state and federal levels, community organizations and representatives, and other stakeholders to obtain feedback and enhance the document. Ultimately the final draft of the vetted document will be widely distributed and may include projects the county and state consider a priority and potential sources of funds obtained through county/state partnerships.

Sponge Nursery to Enhance Filtration of Bay Waters

Using the existing Venetian pilings and slabs, already covered by sponges, corals, and macroalgae, provides an innovative approach to capitalize on existing hard structures without impacting surrounding, protected benthic habitats. Grant funding will support contracted services to map and characterize the Venetian Site's existing sponge and coral species including size and density, piling and concrete slab mapping, identification of interstitial areas where sponge attachment and propagation can take place, and bathymetry. BBAP will work closely with MDC to focus on new, targeted water quality monitoring while utilizing existing water quality data to connect to system-wide issues. Partnering with the Florida Sea Grant Miami-Dade County Extension Agent will facilitate public outreach and education about the pilot project, overall health of Biscayne Bay, and the State and County efforts to restore it.

## V. TASKS:

**Funding Acknowledgement:** All deliverables, presentations, and social media posts will acknowledge the financial assistance provided by the State of Florida, as administered by the Florida Department of Environmental Protection's Coral Protection and Restoration Program.

**Performance Standard for All Tasks:** The Department's Grant Manager will review the task deliverable to verify that the deliverable has been completed as described per task section. Upon review and written acceptance by the Department's Grant Manager, the Grantee may proceed with payment request submittal.

All deliverables shall be submitted electronically unless otherwise indicated. All permit(s) must be acquired prior to work starting (if required). All raw data acquired for this project must be submitted to DEP at the end of the project. All final deliverable(s) must comply with Section 508 of the U.S. Rehabilitation Act (as amended), Florida Statute Chapter 282, and Florida Administrative Code (FAC) Rule: 60-8.002.
The contractor must notify DEP when data from this project will be presented or published. All deliverables, presentations, and social media posts will acknowledge the financial assistance provided by the State of

Florida, as administered by the Office of Resilience and Coastal Protection's Coral Protection and Restoration Program, within the Florida Department of Environmental Protection. Any maps, graphics, charts, or other deliverables intended to visually communicate information should include the following: title and/or appropriate explanation of the visual being presented, consistent scale bar, north arrow and key, and clearly labeled county lines (if applicable). When submitting photo deliverables, a consistent naming convention and organizational structure will be used that includes the date, site name, and any other relevant information. A separate folder will also be created with a smaller subset of photos (5-15 total) that highlight the overall project and can be used for communication pieces and/or messaging. All final deliverables and invoice(s) will be submitted to DEP by the end of the agreement or earlier. DEP may take up to two weeks to review deliverables.

**Task 8.1: Quality Assurance Project Plan – Draft and Final**

**Description:** The Grantee will prepare a Quality Assurance Plan (QA). The QA Plan must be approved by the Department prior to commencement of any monitoring or research associated with the project. The Grantee will use the format provided by the Department's Grant Manager (see Exhibit D – Quality Assurance Requirements).

**Standard and Research QA Exhibit found in Exhibit D:**

The following lists the expected deliverables that are associated with the quality assurance requirements of this Grant:

a. An initial planning review technical audit as specified in Section 5.b.i. of **Exhibit D** shall be completed by the Grantee after the second completed sampling and analysis event, but no later than the fourth. The Grantee shall submit a report of this initial planning review audit within one month of the review, and that report shall include a statement of usability as described in Section 5.b.iii. of **Exhibit D**.
   (i) For research analytes only, when reporting grant field or analytical research results, the Grantee shall submit statements about data usability per Section 8 of **Exhibit D**.

b. Ongoing planning review technical audits shall be conducted annually thereafter for the remainder of the Grant, if applicable to the duration of the Grant, as described in Section 5.b.ii. of **Exhibit D**. The Grantee shall submit a report of each annual planning review audit with a statement of usability (Section 5.b.iii), within one month of the review.

c. The Grantee shall submit the Grant Quality Assurance Plan (QA Plan) as described in Section 6 of **Exhibit D** to the DEP Grant Manager no later than 30 days ***prior to the commencement of field and laboratory activities***. Failure to submit the QA Plan in this required timeframe shall result in a delay of approval to begin work until the document has been submitted to the Department and approved (or conditionally approved) by the DEP Grant Manager.
   (i) The Grantee may submit a version of the QA Plan to the Department for approval no more than three times. If the Grantee fails to obtain approval for the QA Plan after the third (final) submission to the Department, the DEP Grant Manager may suspend or terminate the Grant per the remedies included in the Grant.
   (ii) Within 30 days of receipt of the QA Plan by the Department, the Department shall review and either approve the QA Plan or provide comments to the Grantee as to why the QA Plan is not approved. If further revisions are needed, the Grantee shall then have 30 days from the receipt of review comments to respond. The Department shall respond to all revisions to the QA Plan within 30 days of receipt of any revisions.
   (iii) If the review of the QA Plan by the Department is delayed beyond sixty (60) days after the QA Plan is received by the Department, through no fault of the Grantee, the Grantee shall have the option, after the QA Plan is approved, of requesting an extension in the term of the

Grant for a time not to exceed the period of delayed review and approval. This option must be exercised at least sixty (60) days prior to the current termination date of the Grant. The Department shall then determine whether the request for an extension is allowed.

(iv) If any significant changes in sampling project design, changes in the project analyte list, changes in procedures or test methods, changes in equipment, or changes in key personnel occur, the Grantee shall submit appropriate revisions of the QA Plan to the DEP Grant Manager for review in writing. The proposed revisions may not be implemented until they have been approved (or conditionally approved) by the DEP Grant Manager. If the Grantee fails to submit the required revisions, the DEP Grant Manager may suspend or terminate the Grant per the remedies included in the Grant.

**Deliverable(s):** The grantee will submit a draft QA Plan in Word format and a Final Quality Assurance Plan in Word and PDF format.

**Payment Request Schedule:** N/A

**Task 8.2: Reporting**

**Description:** The Grantee will provide a progress and budget report quarterly per Exhibit A. The progress report will summarize the work completed within each task for the reporting period. It will also provide an update on the estimated completion date for each task and an explanation for any anticipated delays or problems encountered.

**Deliverable(s):** The Grantee will submit: 1) a progress report using Exhibit A in Word format and 2) a budget report in Excel format.

**Payment Request Schedule:** Payment requests may be submitted after the deliverable is received and accepted and may be submitted no more frequently than quarterly.

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**Task 8.3: Biological Restoration to Enhance Water Quality**

*Task 8.3a: Support creation of a living shorelines guidance document (150K)*

**Description:** Compile and evaluate existing environmental regulations that guide restoration and resilience activities as well create and evaluate draft of environmental designs/plans consistent with existing regulations, working with relevant agencies and organizations.

**Deliverable(s):** The Grantee will submit: A report summarizing findings of evaluation of existing environmental regulations and draft environmental design plans.

**Payment Request Schedule:** The Grantee may *{submit a single payment request following approval of the deliverable.}* OR *{submit a payment request no more frequently than monthly (revise as needed).}*

*Task 8.3b: Present working draft with stakeholders including regulated community, regulatory agencies and other relevant agencies and entities to solicit feedback. (100K)*

**Description:** Workshop draft document and finalize, incorporating suggested edits as appropriate.

**Deliverable(s):** The Grantee will submit: 1) A final living shorelines document 2) A list of places, links, platforms, agencies, and/or people the report was disseminated to including but not limited to county, state, and municipal websites.

**Payment Request Schedule:** The Grantee may *{submit a single payment request following approval of the deliverable.}* OR *{submit a payment request no more frequently than monthly (revise as needed).}*

*Task 8.3c: Sponge nursery(ies) host site and donor site characterization and development of experimental design and implementation plan, and permitting. (150K)*

**Description:** This portion of the project will entail characterizing and mapping the host site (i.e., Venetian site or "De Lido Island") to include documentation of sponge and coral species, locations, abundance, density, size, photographs, and GPS locations. Characterization will also include mapping of the existing pilings and concrete slabs on the benthos to document sponges available from which fragments will be collected to propagate and the availability of interstitial spaces on the pilings and slabs to which fragments can be attached. Transport methodology will be developed. Additionally, this phase of the project will include development of experimental design and implementation plan, in concert with County and State agency experts and water quality monitoring pre-transplantation of sponge fragments, and procurement of all applicable permits.

**Deliverable(s):** The Grantee will submit: 1) A report on characterization and mapping work 2) A report summarizing experimental design and implementation plan, and 3) approved permit documentation.

**Payment Request Schedule:** The Grantee may *{submit a single payment request following approval of the deliverable.}* OR *{submit a payment request no more frequently than monthly (revise as needed).}*

*Task 8.3d: Conduct reconnaissance, evaluate methods, and evaluate water quality outcomes. (100K)*

**Description:** This portion of the project will include reconnaissance of potential donor sites of sponges within north Biscayne Bay from which fragments can be obtained, transported, and transplanted at the Venetian site. An assessment of attachment methodologies (i.e., zip tie, cotton string, line or rope stringing, attaching to an intermediary structure such as nails placed into the concrete slabs, etc.) will be conducted. Experimental design implementation measuring survivorship, reattachment rate, growth rate, and monitoring of the host specimen will also occur as well as monitoring of water quality post-propagation and attachment.

**Deliverable(s):** The Grantee will submit: A report summarizing findings.

**Payment Request Schedule:** The Grantee may *{submit a single payment request following approval of the deliverable.}* OR *{submit a payment request no more frequently than monthly (revise as needed).}*

## Task 8.4: Final Project Closeout Executive Report

**Description:** The Grantee will prepare a final project closeout report summarizing all project (task) actions, data, and results including recommendations for future efforts. This task is to be performed by Grantee.

**Deliverable(s):** The Grantee will submit: 1) technical project closeout executive report.

**Payment Request Schedule:** The Grantee will submit a single payment request following approval of the deliverable(s).

## VI. PROJECT TASK TIMELINE:

The tasks must be completed by, and all deliverables received by, the corresponding task end date.

| Task No. | Task Title | Est. Task Start Date | Task End Date | Deliverables | Task Invoice Frequency *(Single, Monthly, Annually, Specific Dates, etc.)* |
|---|---|---|---|---|---|
| 8.1 | Quality Assurance Project Plan - Draft | 1/01/2022 | 1/30/2022 | Draft Quality Assurance Project Plan | N/A |
| | Quality Assurance Project Plan - Final | 2/14/2022 | 2/28/2022 | Final Quality Assurance Project Plan in Word and PDF format | N/A |
| 8.2 | Reporting | 01/31/22 | 03/31/2023 | 1) a progress report using Exhibit A in Word format and 2) a budget report in Excel format. | N/A |
| 8.3a | Support creation of a living shorelines guidance document | 2/01/2022 | 08/31/2022 | Deliverable 8.3a: A report (in Word and pdf) summarizing findings of evaluation of existing environmental regulations and draft environmental design ideas. | Quarterly |
| 8.3b | Present working draft with stakeholders to solicit feedback | 11/01/2022 | 03/31/2023 | Deliverable 8.3b: A final living shorelines document (in Word and pdf) and a list of where report was disseminated including but not limited to county, state, and municipal websites | Quarterly |
| 8.3c | Sponge nursery(ies) host site and donor site characterization and development of experimental design and implementation plan. | 1/01/2022 | 10/01/2022 | Deliverable 8.3c: 1) A report on characterization and mapping work<br><br>Deliverable 8.3c: 2) A report summarizing experimental design and implementation plans | Quarterly |
| 8.3d | Conduct reconnaissance, evaluate methods, and evaluate water quality outcomes | 7/01/2022 | 3/31/2023 | Deliverable 8.d.1: A report summarizing findings | Quarterly |
| 8.4 | Final Report - Draft | 11/01/2022 | 1/01/2023 | Technical Report | N/A |
| | Final Report - Final | 1/01/2023 | 03/31/2023 | Final technical report | Once, upon project completion |

## VII. BUDGET DETAIL BY TASK:

Fixed cost grant funding must not exceed the budget amounts as indicated below. Match funding shall be provided at the minimum amounts in the categories indicated below.

| Task No. | Task Title | Budget Category | Grant Amount | Match Amount | Task Total |
|---|---|---|---|---|---|
| 1 | Quality Assurance Plan | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$** | **$** | |
| 2 | Reporting | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$0** | **$0** | |
| 8a | Support creation of a living shorelines guidance document | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $ |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$200,000** | **$0** | |
| 8b | Present working draft with stakeholders to solicit feedback | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | **$300,000** | **$0** | |
| 8c | Sponge nursery(ies) host site and donor site characterization and development of experimental design and implementation plan. | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $0 | $0 | $0 |
| | | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| | | **Total for Task:** | | | |
| 8d | Conduct reconnaissance, evaluate methods, | Contractual Services | $0 | $0 | $0 |
| | | Miscellaneous/Other Expenses | $300,000 | $0 | $300,000 |

| | | | | | |
|---|---|---|---|---|---|
| | and evaluate water quality outcomes | Salary | $0 | $0 | $0 |
| | | Fringe Benefits | $0 | $0 | $0 |
| | | Equipment | $0 | $0 | $0 |
| **Total for Task:** | | | | | |
| 7 | Final Report | Equipment | $ | $ | $ |
| | | Miscellaneous/Other Expenses | $ | $ | $ |
| | | Salary | $ | $ | $ |
| | | Fringe Benefits | $ | $ | $ |
| | | Equipment | $ | $ | $ |
| **Total for Task:** | | | **$0** | **$0** | |
| **Project Total:** | | | **$500,000** | **$0** | $500,000 |

Note: Authorization for continuation and completion of work and any associated payments may be rescinded, with proper notice, at the discretion of the Department if the Legislature reduces or eliminates appropriations.

## Pilot Project Summary and Locations + Supplemental to Task 7- Stormwater Treatment

### Brief summary of what will be done

The three (3) pilot project locations were selected for the application of new stormwater treatment technologies that would effectively reduce nutrient pollutant discharges to the Bay in combination of other specific stormwater system improvements. The identification of the best technologies selected was based on applicability, effectiveness, durability, maintenance, and cost. The recommended locations for the three pilot projects are based on results from previous completed water quality assessments, specifically in the Little River sub-basin, and in support of recommendations from the Biscayne Bay Task Force. These pre-installation assessments will be used to monitor and document the operational performance of each nutrient removal technology installed during storm events, monitor and document the level of effort required for maintenance, and determine the amount of nutrients and bacteria removed by each type of technology. Selection has also been based on balancing the effectiveness of improving stormwater quality while maintaining the flood quantity level of service.

The selection process of the three (3) stormwater pilot project locations required the participation and coordination of several Miami-Dade County Departments, local agencies, and private companies. The pilot project locations selected represent areas that are highly affected by nutrient pollution, while the existing stormwater drainage infrastructure will serve to test implementation for future projects and provide environmental benefits for the Little River Basin. The implementation of the pilot projects will be in full collaboration of RER-DERM and DTPW.

Specific locations were chosen based on the Little River Basin Water Quality Assessment Report (October 2020) produced by Wood, the County's contractor. The report provides test results related to TN, TP, and bacteria levels throughout the Little River (C-7). In addition, to aid the selection process, staff examined information about the drainage basin, including infrastructure and flow data. The selected pilot projects include a residential area with outfalls with a minimum of water quality treatment system, an arterial road with outfalls without water quality treatment systems, and a residential area discharging through a stormwater pump station with existing water quality treatment. All pilot projects discharge to the Little River (C-7) which is a direct tributary water body to Biscayne Bay.

- **Pilot Project Location 1** is located on a residential area in Miami Dade County bounded by NW 111 Street to the North, NW 107 Street to the South, between NW 21 Ct and NW 17 Avenue and are in an area serviced by septic tanks. Two optimal drainage basins were identified within Pilot Project Location 1 since each basin has an isolated stormwater system that collects stormwater thru a network of solid drainage pipes and discharges to an existing single outfall. The existing stormwater system for basin 1 consists of 63 drainage structures and 5,509 linear feet of solid drainage pipes which ultimately connects to a pollution control structure with a baffle or a flow regulator prior to discharging thru an existing outfall into the C-7 Canal. The total drainage area is 8.50 Acres for basin 1. The existing stormwater system for basin 2 consists of 19 drainage structures and 1,088 linear feet of solid drainage pipes which ultimately connects to a pollution control structure with a baffle or a flow regulator prior to discharging thru an existing outfall into the C-7 Canal. The total drainage area is 5.95 Acres for basin 2. The pollution control structures for both

stormwater systems provide a minimum of water quality treatment to the collected stormwater prior to discharging thru the existing outfalls.

- **Pilot Project Location 2** is located on an arterial roadway in Miami Dade County bounded by NW 96 Street to the North, NW 93 Terrace to the South, between NW 17 Avenue and NW 14 Avenue and is in an area serviced by septic tanks. Two optimal drainage basins were identified within Pilot Project Location 2 since each basin has a stormwater system that collects stormwater thru a network of solid drainage pipes and discharges to an existing single outfall without a pollution control structure to provide additional stormwater water quality treatment prior to discharging into a water body. The existing stormwater system for basin 1 consists of 14 drainage structures and 960 linear feet of solid pipes which ultimately discharges thru an existing outfall into the C-7 Canal. The total drainage area is 3.00 Acres for basin 1. The existing stormwater system for basin 2 consists of 13 drainage structures and 1,010 linear feet of solid pipes which ultimately discharges thru an existing outfall into the C-7 Canal. The total drainage area is 3.50 Acres for basin 2.

- **Pilot Project Location 3** is located on a residential area in Miami Dade County bounded by NW 85 Street to the North, NW 82 Street to the South, between NW 5 Avenue and N. Miami Avenue and are in an area being serviced by septic tanks. Two optimal drainage basins were identified since both systems discharge to the C-7 Canal through two (2) stormwater pump stations, Larchmont Pump Station 1 and 2. Both drainage basins have exfiltration trenches as part of the existing stormwater system which provides water quality treatment for the basins prior to discharge.

Brief summary of the water quality improvement technology

The technologies that have been selected for implementation are considered the best fit for each of the three sites identified, as follows

- **For Pilot Project Location 1,** the technologies selected for each drainage basins include the use in combination of StormBasin Filter and EcoVault unit. The StormBasin is a catch basin insert filter that that can be easily added to existing catch basins and captures and treats stormwater pollutants commonly found in runoff from parking lots or alongside roadways, such as: trash, vegetation, sediment, debris, nutrients, coliform bacteria, oil/grease, and dissolved metals (e.g., lead, copper, cadmium, and chromium). The system uses preassembled proprietary cartridge filters that can be customized for targeted pollutants. The large sediment and debris chamber provides ample storage volume for solids carried in stormwater flows and its design includes a hooded bypass to reduce the potential for flooding during peak storm events while still retaining sediment and debris. The EcoVault can be easily added prior to the existing outfall and consists of a flow regulator box multi-stage system that provides separation, screening, and filtration. The EcoVault will remove sediments, heavy metals, nitrogen, phosphorous, oil, and grease by

the integration of the Baffle Buddy Cassette Filter, which is a high-flow filter integrated into the last baffle wall of the EcoVault. Placement of the technologies will be determined by site conditions while evaluating their efficiencies in the field. Routine maintenance servicing for the StormBasin and EcoVault can be achieved using a Vactor truck, while filters media can be easily accessed manually for servicing.

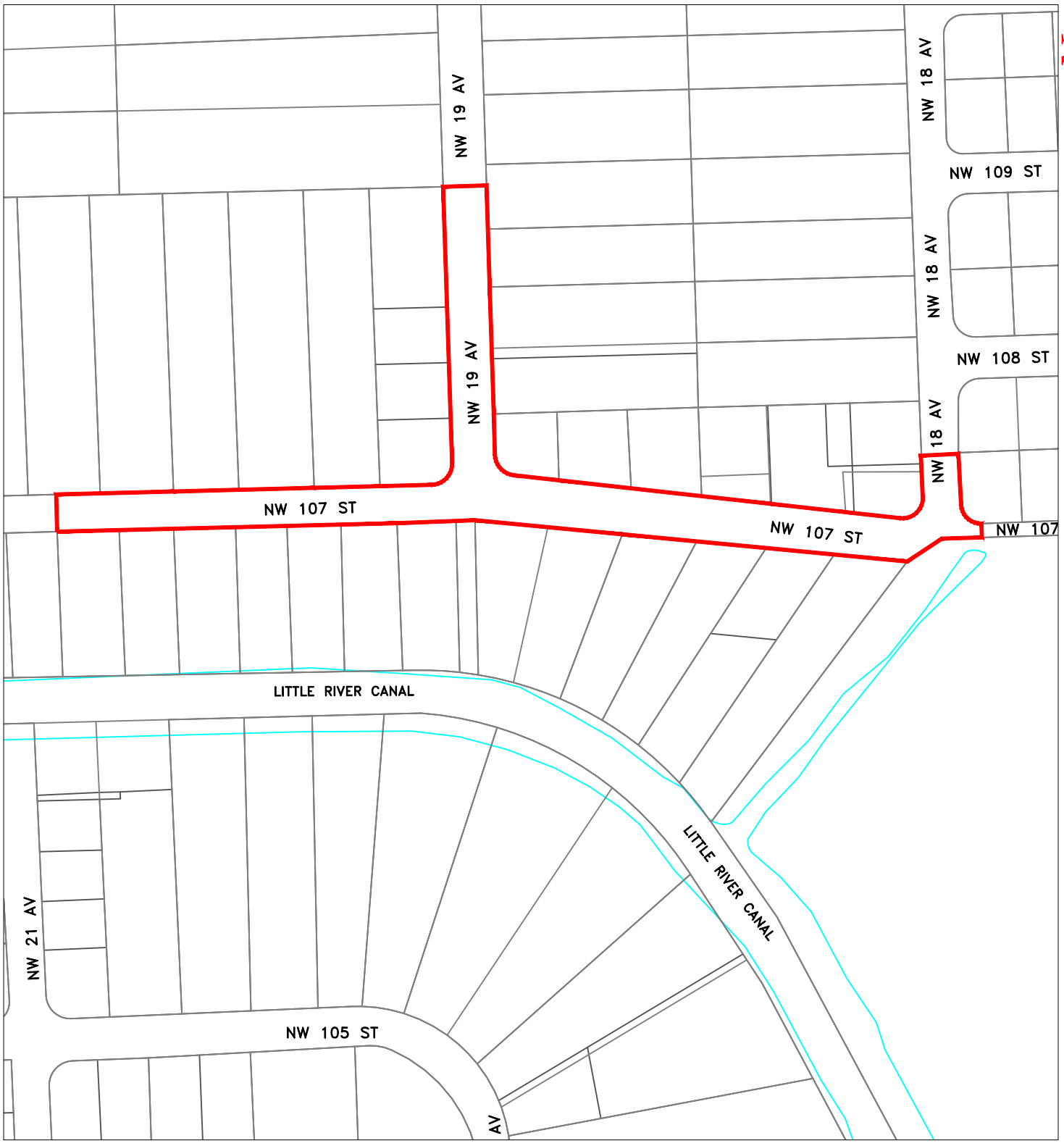
- **For Pilot Project Location 2,** the technologies selected for each drainage area include the use in combination of Hydro DryScreen, AbTech Ultra Urban Filter (UUF) insert with Smart Pak media and SOP Technologies Stormwater Filter with QR codes. The Hydro DryScreen is a next-generation flow regulator box that captures sediment and screens trash and other solids from stormwater, storing organic materials such as leaf litter and prevent nutrients from leaching into surface water runoff between storm events. The AbTech's UUF inserts with Smart Pak media are designed for use in existing stormwater catch basins that experience hydrocarbon and heavy metal pollution accompanied by sediment, debris, or bacteria. The SOP Technologies Stormwater Filter function is to prevent litter/debris entering the drainage structures and are designed for maximum water flow. In addition, SOP Technologies storm drains offer markers with Quick Response (QR) codes, and an associated website application to provide an easy way for community members to share photos and their observations of storm drain filters & inlets. The QR feature offers a way for to engage the community in learning about Miami-Dade County's efforts to protect Biscayne Bay. Placement of the technologies will be determined by site conditions while evaluating their efficiencies in the field. Routine maintenance servicing for the UUF inserts and Hydro DryScreen can be achieved using a Vactor truck while filters media can be easily accessed manually for servicing.

- **For Pilot Project Location 3.** The technologies selected for each drainage area include the Contech JellyFish, SOP Technologies Stormwater Filter Baskets, Abtech Filter Cage and Line Skimmer. The Jellyfish Filter is a stormwater quality treatment technology featuring high flow pretreatment and membrane filtration in a compact stand-alone system. The Jellyfish removes floatable, trash, oil, debris, total suspended solids, fine silt-sized particles, and a high percentage of particulate-bound pollutants, including phosphorus, nitrogen, metals, and hydrocarbons. The SOP Technologies Stormwater Filter Baskets are placed under existing catch basins and are designed for maximum water flow. In addition, SOP Technologies storm drains offer markers with Quick Response (QR) codes, and an associated website application to provide an easy way for community members to share photos and their observations of storm drain filters & inlets. The QR feature offers a way for to engage the community in learning about Miami-Dade County's efforts to protect Biscayne Bay. The Abtech Filter Cage consists of a metal cage with filter media to remove nutrients and bacteria. Line Skimmers employ the Smart Sponge technology which allows water to pass through the product absorbing sheen levels of hydrocarbons without inhibiting water flow. Placement of the technologies will be determined by site conditions while evaluating their efficiencies in the field. Routine maintenance servicing the Jellyfish filter can be achieved using a Vactor truck while filters media can be easily accessed manually for servicing.

The three (3) pilot projects are scheduled to start construction in Fiscal Year 21-22, and their duration will be approximately one and a half years, including permitting, implementation, maintenance cycle(s) and post-installation water quality assessment to evaluate the effectiveness and technology performance.

Results of the implementation of the three pilot projects are expected to provide information needed for future use of new technologies for removing nutrients from the stormwater drainage systems discharging to the Little River and other Biscayne Bay tributaries and increase the understanding of which solutions work best and under which scenarios. Results will ultimately be used to assist with the evaluation of the cost-benefit analysis of implementing different stormwater nutrient removal technologies for stormwater drainage systems discharging into waterbodies of Miami Dade County. In addition, results of these pilot projects can assist to establish and refine policies, that will encourage private developers to implement new technologies in private projects to further mitigate impacts to the health of Biscayne Bay.

# LOCATION MAP
# PILOT PROJECT SITE #1
# REMOVAL OF TOTAL NITROGEN (TN), TOTAL PHOSPHORUS (TP), AND BACTERIA FROM STORMWATER
# NW 107 ST FROM NW 19 AVE TO NW 18 AVE

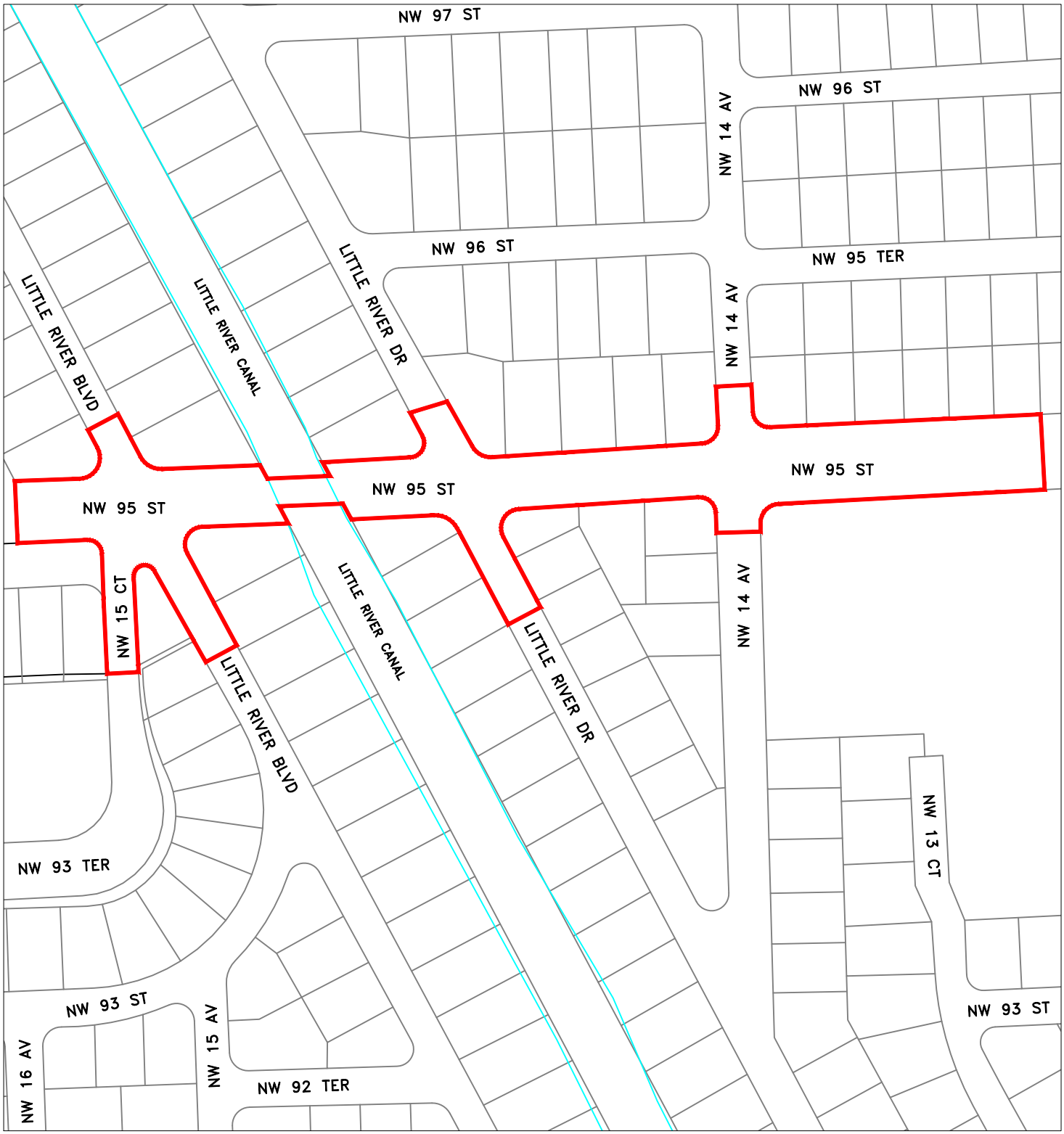



## LOCATION MAP

LEGEND:

PROJECT LOCATION AREA

# LOCATION MAP
# PILOT PROJECT SITE #2
# REMOVAL OF TOTAL NITROGEN (TN), TOTAL PHOSPHORUS (TP), AND BACTERIA FROM STORMWATER
# NW 95 ST FROM NW 17 AVE TO NW 13 AVE



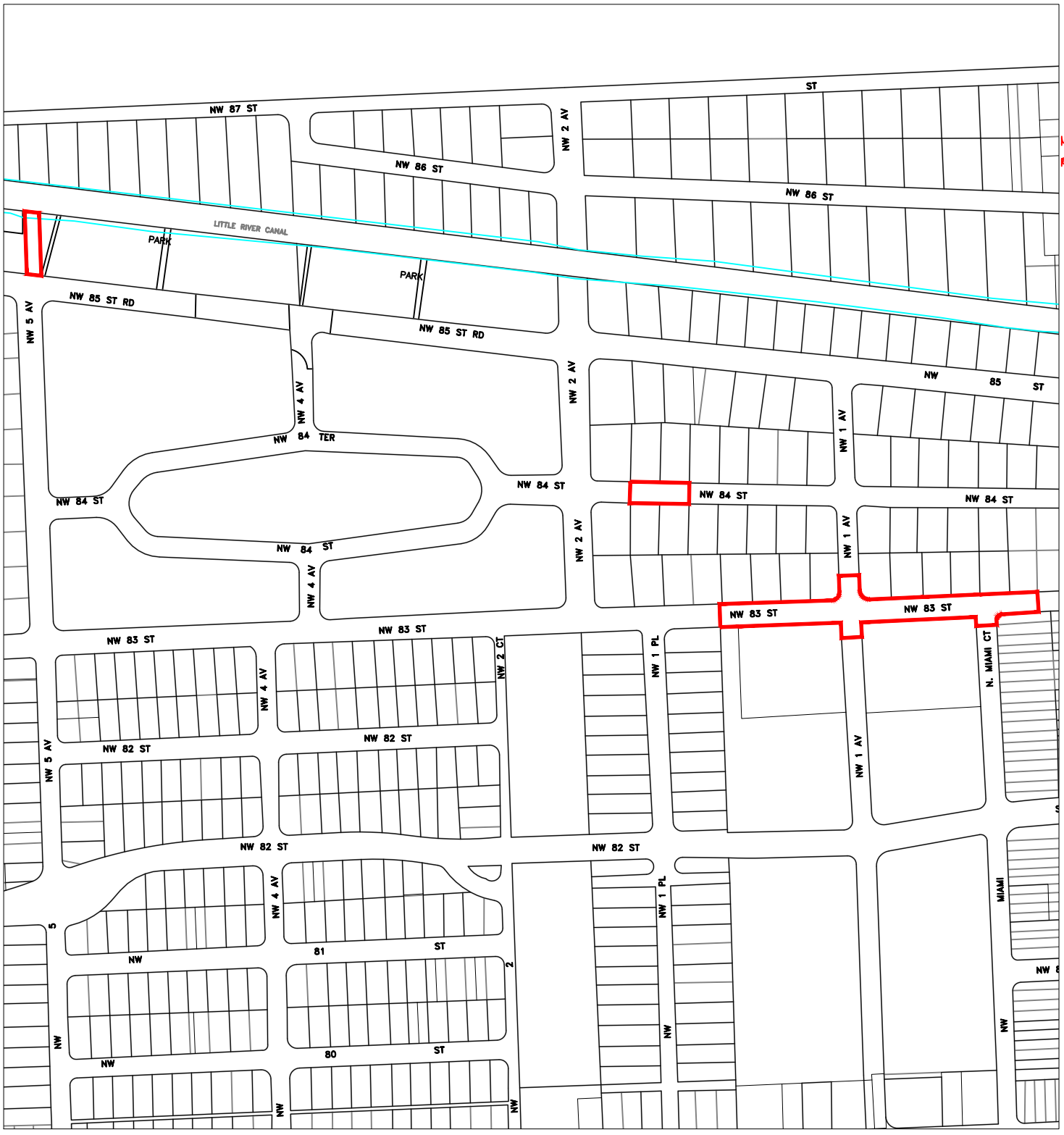

SCALE: 1" = 200'

## LOCATION MAP

LEGEND:

PROJECT LOCATION AREA

# LOCATION MAP
# PILOT PROJECT SITE #3
# REMOVAL OF TOTAL NITROGEN (TN), TOTAL PHOSPHORUS (TP), AND BACTERIA FROM STORMWATER
# NW 83 ST TO NW 85 ST FROM NW 5 AVE TO N. MIAMI AVE




## LOCATION MAP

LEGEND:

PROJECT LOCATION AREA