



Stantec Consulting Services Inc.  
901 Ponce de Leon Boulevard, Suite 900, Coral Gables FL 33134-3070

May 3, 2021

**Attention: Aqeel Abdool-Ghany**  
City of Hallandale Beach  
630 NW 2nd Street  
Hallandale Beach, FL 33009

In accordance with Resolution No. 2020-054, RFP #FY 2018-2019-012 Continuing Professional Architectural and Engineering Services and Other Services, the following scope of services is provided by Stantec Consulting Services Inc. (CONSULTANT) as requested by the CITY to provide Engineering Services.

Dear Mr. Abdool-Ghany,

**Reference: Watershed Master Plan Scope of Work**

As part of the RFP # FY 2018-2019-012 Consultant Competitive Negotiation Act (CCNA) Continuing Professional Architectural and Engineering Services and Other services, The City of Hallandale Beach (CITY) has contracted Stantec Consulting Services Inc. (CONSULTANT) to develop a Watershed Master Plan, associated GIS database and conceptual-level BMPs for the CITY. This Scope of Work includes a development of an Interconnected Ponds and Routing v4 (ICPR) model, survey and associated GIS data based on the best data currently available. The CONSULTANT will produce a hydraulic model for the 4.55 square mile area which will be used to develop and update the 100Y24H floodplain, alternatives analysis and subsequently, preferred, conceptual level Capital Improvement Projects.

The CITY wishes to develop a Five-Year Watershed Master Plan that provides them the ability to clearly identify, prioritize and address issues related to the CITY's water resources. CONSULTANT takes a watershed approach to managing water and water-related resources within the CITY's boundaries. By doing so, all the characteristics of the watershed(s) can be evaluated to reflect the real, interconnected nature of the CITY's water resources. This Watershed Master Plan approach will provide a method to evaluate the capacity of a watershed to protect, enhance and restore water quality and floodplain (natural systems) while achieving sea-level rise protection.

We understand that the CITY is an urban environment predominated by a mixture of intense commercial and residential development, due to the proximity to the Atlantic Ocean. Based on the description in the Comprehensive Plan, "the high density of development and coastal management issues faced by the City should emphasize maintenance, redevelopment or enhancement of existing urban environments rather than protection of natural systems. The Coastal Management Element has been developed to serve as a planning framework for guiding future coastal management decisions in the CITY". Further, we understand the CITY's commitment for the inclusion of Low Impact Development (referenced in the comprehensive plan) within the FEMA CHHA and SFHA Zones; the Watershed Master Plan will build upon the CITY's current commitments to improve stormwater quality and quantity throughout the watershed(s).

Our interest in providing stormwater planning services to the CITY stems from an understanding of the CITY's existing assets and the complexities of managing them – starting from the administrative level and continuing into the day-to-day field operational level.

The goals and objective of this Watershed Master Plan is to:

1. Identify projects implemented over the past decade and provide an evaluation of effectiveness of improvements.

**Reference:** Watershed Master Plan Scope of Work

2. Identify how the CITY's program achievements compare to other stormwater management plans regionally and nationally.
3. Identify operational strategies and capital improvement projects including educational programs and amendments to CITY policies and practices that will optimize operation and maintenance of the stormwater system, reduce freshwater inflows and pollutants to the bays and Atlantic, as well as consider the impacts of sea level rise.
4. Provide CITY staff with a roadmap of fiscally viable projects and programs for the CITY to implement.
5. Develop a report and corresponding GIS application that can serve as living documents and can be used to educate decision makers, stakeholders, and community members.
6. Provide consistency with the Comprehensive Plan

### **Task 1: Project Coordination and Kickoff Meeting**

The CONSULTANT will meet with CITY's staff for a formal project kickoff meeting to review project goals, milestones, schedule, deliverables and budget, as well as for 8 milestone meetings: Data collection and survey needs; Modeling Approach (flood/ quality/ surge); Modeling results and level-of-service analysis; Discuss the locations and types of projects. Additional communication, such as phone calls and emails, will also occur. These communications will occur in addition to any deliverables explicitly listed for subsequent tasks.

Deliverables:

- Attendance at 9 meetings
- Kickoff meeting agenda and meeting minutes (1 meeting)
- Project milestone meeting agendas and meeting minutes (8 meetings)

### **Task 2: Project Management and Quality Control/Quality Assurance (QA/QC)**

The CONSULTANT will provide overall Project Management and coordination of the project including coordination and management, coordination with CITY, preparing monthly progress reports and invoices and management of subconsultant. This task also includes time for quality assurance/quality control for the project. The CONSULTANT will conduct quality assurance and quality control for each task using The CONSULTANT's internal QA/QC process. Quality control reviews will be documented in the CONSULTANT's Comment Geodatabase for the modeling elements and in word documents for memorandums.

### **Task 3 – Data Collection**

CONSULTANT will collect and review the following available data:

#### *Task 3.1 Literature Review*

**Reference: Watershed Master Plan Scope of Work**

Conduct a literature and data review of available monitoring, scientific, and planning information for the CITY. This review shall include but not be limited to federal, state or local planning documents; scientific studies and publications; and other documents that may contain information relevant to calculating and gaining understanding of watershed characteristics, sediment loading, stream flows, water use/restrictions, etc. for the watershed and its tributaries will be conducted. Sources will be cited in the WMP and may include but not be limited to the following:

- Hallandale Beach NPDES Historical Permit Information
- Hallandale Beach Comprehensive Plan
- Hallandale Beach Sustainable Practice Policy
- Hallandale Beach Historical CRS applications/ data
- Broward County Flood Maps
- Seawall Ordinance (File No. 20-080)
- Floodplain Management Ordinance
- City's MS4 permit requirements
- Development Codes for development in flood hazard areas
- County/CITY Stormwater Management Plans
- Historical Flooding (riverine/ sea-level) – documentation
- Hallandale Beach Vulnerability Assessment Action Plan
- CITY's CRS Rating Evaluation Report (when available)
- Other Federal, State or local Resource Management Plans

The CONSULTANT's team members will work with City's staff to review standards. The goal of this task will be to assist with the development of potential codes and standards to help establish compliance with local, state and federal guidelines. We will apply our knowledge sharing insights, opportunities and challenges when reviewing the City's program.

**Deliverable:**

- Report of current standards, goals and guiding principles within the City and summarize efficacy of said literature.

***Task 3.2: Water Quality Requirements***

CONSULTANT will identify regulatory requirements for receiving water bodies and stormwater discharges based on our understanding of both local and national regulatory direction and requirements.

**Reference:** Watershed Master Plan Scope of Work

Deliverable:

- Report outlining water quality requirements for stormwater discharges.

*Task 3.3: Hydrologic/ Hydraulic Model*

The hydrologic feature inventory characterizes the runoff component of the watershed model, represented spatially as model catchments. The CONSULTANT will develop the model domain (extent of model area) and model catchments for potential model development at a scale necessary to accurately assess the complex and interconnected drainage system within the City using the latest available digital elevation model (DEM), the CITY's latest stormwater inventory database, and electronic or hard-copy plan data provided by the CITY.

The CONSULTANT will facilitate acquisition of the any plans needed from the City or available online resources. The hydraulic feature inventory characterizes the hydraulic routing component of the watershed model, represented spatially by model junctions and links. The CONSULTANT will develop the hydraulic connectivity using the CITY's stormwater inventory database, survey and electronic or hard-copy plan data. The CONSULTANT will identify potential survey needs for locations where additional survey may be needed.

The CONSULTANT will meet with the CITY to discuss potential updates to the model scale and additional survey needs following the inventory review.

*Task 3.4: Survey Plan*

The CONSULTANT will coordinate with the CITY and their Sub-CONSULTANT to collect rim and invert elevations needed to develop the model detail as described above. The additional field data will be conducted by the CONSULTANT's Sub-Consultant and collected using survey grade GPS equipment.

Survey data will be collected via GPS with a horizontal/ vertical accuracy within ¼ foot. Data will be provided in Florida State Plane East, North American Datum (NAD) of 1983, units of feet horizontal and the North American Vertical Datum (NAVD) of 1988. The CONSULTANT will use the CITY conversion factor of XX feet to convert existing as-built vertical data where needed from the NGVD of 1929.

Deliverables:

- Coordination with the CITY for the additional survey data
- Rim and invert survey data will be provided in an ASCII file with xyz coordinates.

*Task 3.5: GIS Enhancements*

**Reference: Watershed Master Plan Scope of Work**

CONSULTANT's GIS group will provide record drawing conversions into GIS, GPS data collection, inclusion of surveyed data into geodatabase format. Additionally, our team will further develop the City's ArcGIS Online organization to develop a web-based platform to provide a smart stormwater infrastructure platform. This platform will help assist the city with future updates and maintenance of their GIS data from both the field and the office but will also serve as a dynamic platform that allows the city to monitor and track KPI's related to future Stormwater CIP projects outlined in the Master Plan.

A Modern Master Plan is adaptive and dynamic, giving the City the ability to track real-world indicators against the metrics outlined in the Master Plan to measure the City's Level of Service compared to their target goals. As certain criteria are met (# of days with repetitive flooding, # of new developments within a certain sub-catchment, # of days with repetitive rainfall, to name a few), these metrics help the City prioritize CIP projects, and the platform will help assist the City with compiling available information in GIS for budget requests and loading into the City's CIP progress tracking application.

**Deliverables:**

- Updated Stormwater GIS Data to include any newly captured field data and information transferred from additional record drawings
- An ArcGIS Online Field Map project set-up for field data collection and updating of stormwater infrastructure
- An ArcGIS Online app and dashboard to facilitate the tracking of KPI metrics outlined in the Master Plan

**Task 3.6: Water Quality Data**

Evaluate City's/ County's water quality monitoring program; including:

- Broward County Water Quality Data
- USGS Water Quality and Levels
- South Florida Water Management District DBHYDRO Database

**Deliverables:**

- Summarize and evaluation of existing Water Quality Data
- Report for additional water quality information

**Task 4: Stakeholder Engagement**

Conduct a public meeting on program achievements and to gain direction from the community.

The CONSULTANT proposes to work with the CITY to hold a community meeting on the CITY's Watershed Master Plan. Our team will provide key staff to inform the public on complex technical matters. The CONSULTANT will develop large format graphics, illustrative materials, and presentations. (may need to be

**Reference:** Watershed Master Plan Scope of Work

virtual). The CONSULTANT will generate a report following public meetings including documentation of public comments and concerns.

The level of effort associated with this task assumes the CITY will lead and plan the meeting as well as handle notification and make any PowerPoint presentation files to the public. The CONSULTANT will provide electronic map templates of the proposed CIPs and the CITY will make hard copy boards.

**Deliverables:**

- Attendance at coordination meeting with the CITY
- Attendance of 2 staff at two public meetings
- Attendance at presentation to City Commission
- Electronic graphics required for the public meeting

**Assumptions:**

Virtual Public Meetings

In person Board Meeting

#### **Task 5: Review Design Criteria and Level-of-Service (LOS) Analysis**

Review Development Code (Ordinance/ Code -both existing and drafts of relevant ordinances and/or code) and Comprehensive Plan Stormwater Principles

- Meet monitoring and removal of contaminants from surface water discharges to National Pollutant Discharge Elimination System (NPDES) Stormwater Permit requirements
- Evaluate major storm related drainage problems to ascertain needs to mitigate flood damages. Major storms defined as rainfall volumes and intensities outside of two standard deviations; definition of Major Storms may be modified as work progresses
- Perform dredging in drainage canals
- Implement major drainage improvement projects in the northeast section of the City
- Design Storm for onsite retention: 5-year frequency; 1 hour duration; 3.3 total inches
- Low Impact Development - Sustainable stormwater capture system
- Urban Forest and Tree Canopy
- Sea Level Rise
- Maintenance Activities/ Plan

**Reference: Watershed Master Plan Scope of Work**

Evaluate CITY's stormwater level of service for both water quality and water quantity. Our team will start with the discussion on Level of Service developed previously and will evaluate how the recommended level of service is incorporated into the CITY's stormwater and policy framework. We will identify how the CITY and other authorities have actually administered or enforced the development rules within the community. We will also interview CITY Stormwater Division staff as well as peer department staff to document and conform what is and to what degree services and programs are being provided.

The CONSULTANT will perform an existing conditions level-of-service analysis for the 25-year/24-hour and 100-year 24-hour design storm events. This analysis will be based on the CITY's LOS criterion. Roadway elevations to be used as the basis for this level-of-service analysis will be extracted from the DEM. The CONSULTANT will evaluate the roadway flooding throughout the watershed, in terms of location, flooding depth, and flooding duration to identify the flooding problems throughout the watershed. These flooding areas will be identified as flooding areas of concern (FAC) and will be the basis for locations to be evaluated during the Best Management Practices (BMP) Alternatives Analysis task.

We will incorporate the findings associated with the surge and sea level rise modeling activities previously completed.

**Deliverables:**

- Point feature class in geodatabase (modified GWIS schema) indicating locations of flooding with depth and duration for the 25- and 100-yr. 24-hour events
- Confirmation of Special Flood Areas and High Hazard Areas in geodatabase (modified GWIS schema)
- Draft level of service report outlining the floodplain level of service determination and areas
- Final Level of Service report; detailing existing and proposed LOS.

## **Task 6: Hydraulic/ Hydrologic Modeling**

### **Stormwater Hydraulic/ Hydrologic Flood Modeling**

#### ***Task 6.1: Model Schematic***

The CONSULTANT will create a model schematic for the CITY based on the hydrologic and hydraulic feature inventories completed for Task 3. The CONSULTANT will develop model-element names using the CITY's naming convention. The CONSULTANT will develop and deliver the preliminary model schematic as GIS data using a modified GWIS ICPR Model Dataset schema; this does not include generation of a hydro network or hydraulic element points. The CONSULTANT will meet with the CITY to review the model schematic.

The CONSULTANT will develop catchment boundaries using ArcHydro methodologies and/or manual methods. These catchment boundaries will follow the ridgelines based in the DEM data, and be used to develop model parameters (i.e. overflow connections, basin storage). The final catchment boundaries will be smoothed and/or simplified to show clean and more realistic boundary lines based on field conditions, plan/permit information, etc.

**Reference:** Watershed Master Plan Scope of Work

The CONSULTANT will reconcile the watershed model boundary with other existing models as available. During this process, the CONSULTANT will match the boundaries of adjacent models where appropriate but may conflict with adjacent model boundaries if sufficient data warrants it. CONSULTANT will establish boundary connections and boundary conditions where needed. However, it may be necessary to diverge from the elements of adjacent models due to newer and more accurate information. The CONSULTANT will establish boundaries as necessary in the current project to reflect current conditions but will not update adjacent models.

**Deliverables:**

- Preliminary model schematic in CITY geodatabase (modified GWIS schema).

#### *Task 6.2: Model Parameterization*

The CONSULTANT will develop model parameters based on the model schematic, field reconnaissance, and survey completed in Task 3 while maintaining existing model parameters as warranted. The CONSULTANT will develop model parameters in accordance with the CITY's stormwater preferences. Model parameters will be documented using a modified GWIS ICPR table schema. The digital elevation model (DEM) for the CITY will be used for stage-area data.

Model tailwater boundary condition will be the Mean Higher Highwater (MHHW) tide as reported by the nearest NOAA tide gage that has a NAVD88 datum. Boundary conditions from adjacent watersheds will be extracted from the existing conditions models and used in time/stage format. Available data for underground stormwater vaults within the project area will be reviewed and may be neglected from modeling if deemed inconsequential.

**Deliverables:**

- Model schematic and associated parameters in geodatabase (modified GWIS schema).

#### *Task 6.3: Model Development*

The CONSULTANT will simulate the 25- and 100- year, 24-hour storm events. Rainfall depths and distributions will be based on the CITY's stormwater preferences. The CONSULTANT will adjust model parameters developed as part of Task 8.2 for model stability and accuracy and will include boundary stages or flows from adjacent watershed models as available for each storm simulated; boundary stages may be used to determine model boundary flows. The CONSULTANT will review model results relative to available flood data for use as model verification.

CONSULTANT will meet with the CITY to discuss model results if desired. No model calibration will be completed as part of this task.

**Deliverables:**

- Model schematic and associated parameters in geodatabase (modified GWIS schema)
- ICPR model and results files
- Brief Technical Memorandum documenting model development



**Reference:** Watershed Master Plan Scope of Work

#### *Task 6.4: Preliminary Floodplain Development*

Upon CITY acceptance of the ICPR model developed for Task 6.3, the CONSULTANT will develop preliminary level-pool floodplains for results from the 100-year and 25-year 24-hour storm event ICPR simulations for use in model results review and LOS analysis. Transition zones, representative A zones, and other estimated flood areas will not be included. The CONSULTANT will deliver the preliminary floodplains as GIS polygon data. The CONSULTANT will meet with the CITY to review preliminary floodplains. This task does not include floodplain submission to FEMA.

Deliverables:

- Preliminary floodplains in geodatabase (modified GWIS schema)

#### **Task 7: Best Management Practices (Conceptual Projects)**

The CONSULTANT will develop conceptual level plans for 5 preferred alternatives that contain sufficient detail to complete cost benefit analyses. The conceptual plans will include opportunities for both operations and capital improvements, conveyance improvements, water quality improvements, and resiliency/ hardening plans. The conceptual plans will assume that permit plans would be completed under a separate contract. The design plans will include, at minimum, the following sheets:

- Conceptual detailed schematic
- Existing/ Proposed Conditions Drainage Map
- Typical Sections
- Preliminary Drainage Details

The design plans will not include any of the following:

- Utility Plans
- Right-way-Sheets
- Structural details

Develop up to 5 project elements to be used in combination to develop up to 5 conceptual projects. The projects will incorporate both water quality and water quantity elements. A ranking methodology will be developed with input from staff/stakeholders so that the most effective projects are considered. Each of the conceptual projects will be incorporated into the ICPR Model to determine project efficacy.

CONSULTANT will evaluate each selected alternative in BMPTRAINS model to determine the appropriate suite of BMPs to address LOS deficiencies. BMPTRAINS will determine the treatment effectiveness and

**Reference: Watershed Master Plan Scope of Work**

associated TN and TP load reductions for each of the alternatives. GIS information such as land use and directly connected impervious area will be used as an input for the BMPTRAINS model.

CONSULTANT will assess impacts of projects related to Sea Level Rise and Impacts from Climate Change. CONSULTANT will provide strategy for how climate change impacts will be evaluated including but not limited to:

- Determine types of modeling to be used to assess the sensitivity of the hydrological and water quality response to future climate-conditions
- Identify climate change scenarios and how they will impact the stormwater infrastructure (i.e. saltwater intrusion, inundation of wetlands, water availability and quality, changes in habitat and species distribution, predictions of increased storms)
- Provide findings and incorporate into management measures and plan implementation

The preliminary analysis for these conceptual projects will include the identification of additional property, and whether right of way or easements are required to construct the project(s). CONSULTANT will summarize the results of the analysis into a technical memorandum that outlines the projects such that they could go to project design. The preliminary design will be presented to CITY for review and approval. The concept projects may include:

- Modifications/additions to the existing drainage systems
- Modifying/enlarging the existing pond systems/canal systems
  - Considering check valves or similar device to prevent tidal backflow into the stormwater system(s)
  - Exploring the use of pumping stations to drawdown the ponding systems to maximum capacity during storms or expelling runoff

**Deliverables:**

- Up to 5 executive summaries for each of the conceptual projects
- Electronic Proposed Conditions Model ICPR model for each project
- BMPTRAINS output/ results for each project
- Electronic Proposed Conditions GIS Database for each master project

**Reference:** Watershed Master Plan Scope of Work

- ArcGIS Online Web-application outlining each master project with details and metrics
- Conceptual Design Schematics (11"x17")
- Engineer's Opinion of Probable Costs
- Alternative Analysis Technical Memorandum

### **Task 8: Cost Benefit Model**

The CONSULTANT utilizes a Cost Effective developed based on the FEMA Benefit-Cost Analysis (BCA). The BCA will consider local cost data. The BCA considers flood, surge and will incorporate measurable water quality benefits with consideration of presumptive benefits; and will use local cost data where available. The BCA provides a present worth analysis of the annualized damages over the lifetime of the proposed improvements; while it currently doesn't consider future worth of proposed projects, it can be modified to do so. The CONSULTANT BCA will mimic the FEMA BCA as closely as possible to help establish consistency with local and federal standards.

Deliverables:

- Memorandum of Findings
- Electronic copy of the updated Benefit-Cost Analysis
- User's manual describing input data and explanation of model results

#### *Task 8.1 Prepare Cost/Benefit Matrix*

Recommended BMPs will be presented in a prioritized cost benefit matrix ranked by measurable benefit for pollutant load reduction, flood protection and natural systems improvement.

Deliverables:

- Draft Matrix
- Final Matrix

**Reference:** Watershed Master Plan Scope of Work

### **Task 9: CRS Rating Report Review**

CONSULTANT will meet with the CITY's consultant providing CRS Rating Evaluation. CONSULTANT will review CRS Rating Evaluation report and update the Watershed Master Plan (WMP) to ensure that findings from CRS Evaluation are included in WMP. Additionally, CONSULTANT will provide CRS Rating Evaluation consultant with preliminary / final findings of WMP to avoid potential inconsistencies and/or contradictions between the two reports.

CONSULTANT will coordinate with CITY's consultant to ensure that the findings from both reports are shared and presented appropriately by both parties to maximize CRS class rating.

**Deliverable:**

- Review of CRS Rating Evaluation Report
- Incorporation of findings from CRS Rating Evaluation Report into Watershed Master Plan

### **Fees**

<b>TASK</b>	<b>DESCRIPTION</b>	<b>FEE (\$)</b>
1	Project Coordination and Kickoff Meeting	\$ 17,429
2	Project Management and QA/OC	\$ 15,820
3	Data Collection	\$ 103,356
4	Stakeholder Engagement	\$ 13,990
5	Review Design Criteria and LOS Analysis	\$ 26,744
6	Hydraulic/ Hydrologic Modeling	\$ 139,820
7	Best Management Practices (Conceptual Projects)	\$ 94,192
8	Cost Benefit Model	\$ 25,540

Reference: Watershed Master Plan Scope of Work

TASK	DESCRIPTION	FEE (\$)
9	CRS Rating Report Review	\$ 4,752
	<b>TOTAL LUMP SUM</b>	<b>\$ 441,643</b>

### Assumptions and Exclusions

- Public information exists to develop or enhance a Digital Elevation Model.
- CITY will provide available existing drawings, as-builts, survey documents, underground utility investigations, tv inspections and reports of point repairs of the existing storm water sewer infrastructure.
- The engineering opinion of probable construction cost estimates to be developed under the attached Scope of Work is identified in accordance with the cost estimate classes as defined by AACE International. The CITY acknowledges that CONSULTANT has no control over costs of labor, materials, competitive bidding environments and procedures, unidentified field conditions, financial and/or market conditions, or other factors likely to affect the probable cost of the construction, all of which are and will unavoidably remain in a state of change, especially in light of the high volatility of the market attributable to the natural disasters and the associated cleanup/restoration activities and other events beyond the control of CONSULTANT. The CITY further acknowledges that this is a “snapshot in time” and that the reliability of this engineering opinion of probable construction cost will inherently degrade over time.
- The stormwater hydraulic model will be developed based on the 100Y24H floodplain.
- Hydraulic modeling software used in the development of the stormwater master plan will be ICPR version 4.
- Assessment of sediment loads and transport to the bay from the City's watershed to assess current impacts of land use on erosion and sedimentation in the drainage basin is not included in this scope of work
- Stormwater Fee Feasibility Analysis and Report is not included in this scope of work
- Roadway elevations to be used in this analysis will be extracted from available DEM.
- It is assumed that the meetings in Task 1 will be held via Microsoft Teams.
- Survey data will be collected via GPS (horizontal/ vertical accuracy within ¼ foot).

**Reference:** Watershed Master Plan Scope of Work

- Survey of 20 inverts / Rim elevations/ day; 10 days
- CONSULTANT shall be entitled to rely upon the information and data provided by the County or obtained from generally acceptable sources within the industry without independent verification except to the extent such verification is expressly included in the Work.
- The following tasks are specifically excluded from this WA:
  - Development of Preliminary Plans
  - Topographic / Finished Floor Elevation Surveys
  - Environmental Survey
  - Delineation of Wetlands
  - Payment of permitting Fees
  - Identification and/or preparation of exhibits and legal descriptions for temporary or permanent easements
  - Meetings with regulatory agencies, including but not limited to SFWMD, USACE, DEP; except where expressly defined in scope.)

Regards,

**Stantec Consulting Services Inc.**



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Attachment: CHOB stormwater master plan DRAFT manhour and fees 5-3-2021 Rev3  
cd(g document2

Project: Budget: \$ 441,643

TASK	INTERNAL	SUBS
Task 1: Project Coordination and Kickoff Meeting	\$ 17,429	
Task 2: Project Management and Quality Control/Quality Assurance (QA/OC)	\$ 15,820	
Task 3.1 Literature Review	\$ 13,800	
Task 3.2: Water Quality Requirements	\$ 7,021	
Task 3.3: Hydrologic/ Hydraulic Model	\$ 25,045	
Task 3.4: Survey Plan	\$ 20,090	
Task 3.5: GIS Enhancements	\$ 26,380	
Task 3.6: Water Quality Data	\$ 11,020	
Task 4: Stakeholder Engagement	\$ 13,990	
Task 5: Review Design Criteria and Level-of-Service (LOS) Analysis	\$ 26,744	
Task 6: Modeling	\$ 139,820	
Task 7: Best Management Practices (Conceptual Projects)	\$ 94,192	
Task 8: Cost Benefit Model	\$ 25,540	
Task 9: Opportunities to Increase CRS Rating	\$ 4,752	
SUB-TOTAL	\$ 441,643	\$ -
TOTAL	\$	441,643

INTERNAL  
SUB  
MASTER CELL

Task 1: Project Coordination and Kickoff Meeting Dave Clarke Ben Quartermaine Jordan Corby Kelly Westover Jared Zech Ron Coppinger Terry Picard Nick Alexandrou Jordan Corby Tim Foushee

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Attendance at 9 meetings		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	9	\$ 1,530		\$ -		\$ -		\$ -		\$ -	9	\$ 1,530
Kickoff meeting agenda and meeting min	1	\$ 260	1.5	\$ 300		\$ -	1.50	\$ 255		\$ -		\$ -	2	\$ 216		\$ -		\$ -		\$ -		\$ -		\$ -	6	\$ 1,031
Project milestone meeting agendas and meeting minutes (8 meetings)	7.5	\$ 1,950	12	\$ 2,400		\$ -		\$ -		\$ -		\$ -	12	\$ 1,296	8	\$ 1,360		\$ -		\$ -		\$ -		\$ -	40	\$ 7,006
Internal Project Team Meetings (8)	7.5	\$ 1,950	12	\$ 2,400		\$ -	4.00	\$ 680	8	\$ 1,040		\$ -	4	\$ 432	8	\$ 1,360		\$ -		\$ -		\$ -		\$ -	44	\$ 7,862
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		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	16	\$ 4,160	26	\$ 5,100	-	\$ -	6	\$ 935	8	\$ 1,040	-	\$ -	18	\$ 1,944	25	\$ 4,250	-	\$ -	-	\$ -	-	\$ -	-	\$ -	98	\$ 17,429

Task 2: Project Management and Quality Control/Quality Assurance (QA/OC)

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
QA/QC - Modeling	16	\$ 4,160		\$ -		\$ -		\$ -	12	\$ 1,560		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	28	\$ 5,720
QA/QC - GIS		\$ -		\$ -		\$ -		\$ -		\$ -	12	\$ 1,320		\$ -	12	\$ 2,040		\$ -		\$ -		\$ -		\$ -	24	\$ 3,360
QA/QC - Deliverables	16	\$ 4,160		\$ -		\$ -	6	\$ 1,020	12	\$ 1,560		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	34	\$ 6,740
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	32	\$ 8,320	0	\$ -	0	\$ -	6	\$ 1,020	24	\$ 3,120	12	\$ 1,320	0	\$ -	12	\$ 2,040	0	\$ -	0	\$ -	-	\$ -	0	\$ -	86	\$ 15,820

Task 3: Data Collection  
Task 3.1 Literature Review

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Hallandale Beach NPDES Historical Permit Information	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	5	\$ 725
Hallandale Beach Comprehensive Plan	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 280		\$ -		\$ -		\$ -	3	\$ 445
Hallandale Beach Sustainable Practice Policy	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 280		\$ -		\$ -		\$ -	3	\$ 445
Hallandale Beach Historical CRS applications/ data	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 280		\$ -		\$ -		\$ -	3	\$ 445
Broward County Flood Maps	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	5	\$ 725
Seawall Ordinance (File No. 20-080)	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 280		\$ -		\$ -		\$ -	3	\$ 445
Floodplain Management Ordinance	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 280		\$ -		\$ -		\$ -	3	\$ 445
City's MS4 permit requirements	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	5	\$ 725
Development Codes for development in flood hazard areas	0.25	\$ 65	2	\$ 400		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 280		\$ -		\$ -		\$ -	4	\$ 745
County/CITY Stormwater Management Plans	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 280		\$ -		\$ -		\$ -	3	\$ 445
Historical Flooding (riverine/ sea-level) – documentation	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 280		\$ -		\$ -		\$ -	3	\$ 445
Other Federal, State or local Resource Management Plans	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 280		\$ -		\$ -		\$ -	3	\$ 445
Report	2	\$ 520	20	\$ 4,000		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	20	\$ 2,800		\$ -		\$ -		\$ -	42	\$ 7,320
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	5	\$ 1,300	27.5	\$ 5,500	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	50	\$ 7,000	0	\$ -	-	\$ -	0	\$ -	83	\$ 13,800



Task 3.2: Water Quality Requirements

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Identify regulatory requirements	0.25	\$ 65	1	\$ 200		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	5	\$ 825
Identify Receiving Body	0.25	\$ 65	2	\$ 400		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	6	\$ 1,025
Local / State	0.25	\$ 65	2	\$ 400		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	6	\$ 1,025
Report	0.25	\$ 65	4	\$ 800		\$ -		\$ -		\$ -		\$ -	12	\$ 1,296		\$ -	8	\$ 1,120		\$ -		\$ -		\$ -	24	\$ 3,281
Confirmation with Staff (meeting)	0.25	\$ 65	4	\$ 800		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	4	\$ 865
Total	1.25	\$ 325	13	\$ 2,600	0	\$ -	0	\$ -	0	\$ -	0	\$ -	12	\$ 1,296.00	0	\$ -	20	\$ 2,800	0	\$ -	0	\$ -	0	\$ -	46	\$ 7,021

Task 3.3: Hydrologic/ Hydraulic Model

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
develop the model domain	0.25	\$ 65	2	\$ 400		\$ -		\$ -	20	\$ 2,600		\$ -		\$ -	8	\$ 1,360	10	\$ 1,400		\$ -		\$ -		\$ -	40	\$ 5,825
model catchment input data	0.25	\$ 65	4	\$ 800		\$ -		\$ -	16	\$ 2,080		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	20	\$ 2,945
Review DEM	0.25	\$ 65	1	\$ 200		\$ -		\$ -	8	\$ 1,040		\$ -		\$ -	8	\$ 1,360		\$ -		\$ -		\$ -		\$ -	17	\$ 2,665
Review City's Database	0.25	\$ 65	1	\$ 200		\$ -		\$ -	24	\$ 3,120		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	29	\$ 3,945
Review Survey	0.25	\$ 65	1	\$ 200		\$ -		\$ -	8	\$ 1,040		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	13	\$ 1,865
Review Asbuilts	0.25	\$ 65	2	\$ 400		\$ -		\$ -	8	\$ 1,040		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	14	\$ 2,065
Hydrologic Inputs	0.25	\$ 65	2	\$ 400		\$ -		\$ -	10	\$ 1,300		\$ -		\$ -		\$ -	5	\$ 700		\$ -		\$ -		\$ -	17	\$ 2,465
Basin Development	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -	8	\$ 1,040		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	13	\$ 1,765
Areas	0.25	\$ 65	0.5	\$ 100		\$ -		\$ -	4	\$ 520		\$ -		\$ -	4	\$ 680	1	\$ 140		\$ -		\$ -		\$ -	10	\$ 1,505
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	2.25	\$ 585	14	\$ 2,800	0	\$ -	0	\$ -	106	\$ 13,780	0	\$ -	0	\$ -	20	\$ 3,400	32	\$ 4,480	0	\$ -	0	\$ -	0	\$ -	174	\$ 25,045

Task 3.4: Survey Plan

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Develop survey plan based on size of model	4	\$ 1,040	10	\$ 2,000		\$ -		\$ -	5	\$ 650		\$ -		\$ -		\$ -	10	\$ 1,400		\$ -		\$ -		\$ -	29	\$ 5,090
Surveyor		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ 15,000
Total	4	\$ 1,040	10	\$ 2,000	0	\$ -	0	\$ -	5	\$ 650	0	\$ -	0	\$ -	0	\$ -	10	\$ 1,400	0	\$ -	0	\$ -	0	\$ -	29	\$ 20,090

Task 3.5: GIS Enhancements

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Infrastructure Data Updates		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	20	\$ 3,400	80	\$ 11,200		\$ -		\$ -		\$ -	100	\$ 14,600
Data Schema Development		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	24	\$ 4,080	8	\$ 1,120		\$ -		\$ -		\$ -	32	\$ 5,200
Web Application Wire Framing		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	8	\$ 1,360	8	\$ 1,120		\$ -		\$ -		\$ -	16	\$ 2,480
Web Application Final Development		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	4	\$ 680	16	\$ 2,240		\$ -		\$ -		\$ -	20	\$ 2,920
Technical Documentation		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 340	6	\$ 840		\$ -		\$ -		\$ -	8	\$ 1,180
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	0	\$ -	58	\$ -	118	\$ -	0	\$ -	-	\$ -	0	\$ -	176	\$ 26,380



Task 3.6: Water Quality Data

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Meeting with Staff	1	\$ 260	2	\$ 400		\$ -	4	\$ 680		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	7	\$ 1,340
Meeting with County Staff	1	\$ 260	2	\$ 400		\$ -	4	\$ 680		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	7	\$ 1,340
Review Data	1	\$ 260	2	\$ 400		\$ -		\$ -	8	\$ 1,040		\$ -		\$ -		\$ -	10	\$ 1,400		\$ -		\$ -		\$ -	21	\$ 3,100
Data Summary	1	\$ 260	2	\$ 400		\$ -		\$ -	8	\$ 1,040		\$ -		\$ -		\$ -	10	\$ 1,400		\$ -		\$ -		\$ -	21	\$ 3,100
Tech Memo	1	\$ 260	4	\$ 800		\$ -		\$ -		\$ -		\$ -	10	\$ 1,080		\$ -		\$ -		\$ -		\$ -		\$ -	15	\$ 2,140
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	5	\$ 1,300	12	\$ 2,400	0	\$ -	8	\$ 1,360	16	\$ 2,080	0	\$ -	10	\$ 1,080	0	\$ -	20	\$ 2,800	0	\$ -	0	\$ -	0	\$ -	71	\$ 11,020

Task 4: Stakeholder Engagement

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Public Meetings (2) virtual	3	\$ 780	3	\$ 600		\$ -	3	\$ 510	20	\$ 2,600		\$ -	20	\$ 2,160		\$ -	10	\$ 1,400		\$ -		\$ -		\$ -	59	\$ 8,050
Board Presentation	6	\$ 1,560	6	\$ 1,200		\$ -	6	\$ 1,020		\$ -		\$ -	20	\$ 2,160		\$ -		\$ -		\$ -		\$ -		\$ -	38	\$ 5,940
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	9	\$ 2,340	9	\$ 1,800	0	\$ -	9	\$ 1,530	20	\$ 2,600	0	\$ -	40	\$ 4,320	0	\$ -	10	\$ 1,400	0	\$ -	0	\$ -	0	\$ -	97	\$ 13,990

Task 5: Review Design Criteria and Level-of-Service (LOS) Analysis

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Meeting with Staff		\$ -	4	\$ 800		\$ -	4	\$ 680		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	8	\$ 1,480
Develop Land use Data Model		\$ -	4	\$ 800		\$ -	4	\$ 680		\$ -		\$ -		\$ -	24	\$ 4,080	20	\$ 2,800		\$ -		\$ -		\$ -	52	\$ 8,360
Identify areas where sedimentation occurs		\$ -	2	\$ 400		\$ -		\$ -		\$ 1,040		\$ -		\$ -		\$ -	8	\$ 1,120		\$ -		\$ -		\$ -	18	\$ 2,560
Sediment loading rates		\$ -	2	\$ 400		\$ -		\$ -	4	\$ 520		\$ -		\$ -		\$ -	8	\$ 1,120		\$ -		\$ -		\$ -	14	\$ 2,040
Model		\$ -	4	\$ 800		\$ -		\$ -		\$ -		\$ -	4	\$ 432	16	\$ 2,720	10	\$ 1,400		\$ -		\$ -		\$ -	34	\$ 5,352
O&M Research	2	\$ 520	8	\$ 1,600		\$ -		\$ -	16	\$ 2,080		\$ -	4	\$ 432	4	\$ 680	8	\$ 1,120		\$ -		\$ -		\$ -	42	\$ 6,432
Results	2	\$ 520		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	2	\$ 520
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	4	\$ 1,040	24	\$ 4,800	0	\$ -	8	\$ 1,360	28	\$ 3,640	0	\$ -	8	\$ 864	44	\$ 7,480	54	\$ 7,560	0	\$ -	0	\$ -	0	\$ -	170	\$ 26,744

Task 6: Modeling

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
develop the model domain	1	\$ 260	10	\$ 2,000		\$ -		\$ -	40	\$ 5,200		\$ -		\$ -	20	\$ 3,400	20	\$ 2,800		\$ -		\$ -	20	\$ 3,400	111	\$ 17,060
model catchment input data	1	\$ 260	20	\$ 4,000		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	21	\$ 4,260
Review DEM	1	\$ 260	4	\$ 800		\$ -		\$ -		\$ -		\$ -		\$ -	40	\$ 6,800		\$ -		\$ -		\$ -	10	\$ 1,700	55	\$ 9,560
Review City's Database	1	\$ 260	4	\$ 800		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	40	\$ 5,600		\$ -		\$ -	10	\$ 1,700	55	\$ 8,360
Hydraulic Connectivity	1	\$ 260	4	\$ 800		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	120	\$ 16,800		\$ -		\$ -	20	\$ 3,400	145	\$ 21,260
Review Survey	1	\$ 260	4	\$ 800		\$ -		\$ -	80	\$ 10,400		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	10	\$ 1,700	95	\$ 13,160
Review Asbuilts	1	\$ 260	4	\$ 800		\$ -		\$ -	80	\$ 10,400		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	10	\$ 1,700	95	\$ 13,160
Model Scale	1	\$ 260	20	\$ 4,000		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	40	\$ 6,800	61	\$ 11,060
Hydrologic Inputs	1	\$ 260	4	\$ 800		\$ -		\$ -	40	\$ 5,200		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	20	\$ 3,400	65	\$ 9,660
Basin Development	1	\$ 260	4	\$ 800		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	20	\$ 2,800		\$ -		\$ -	60	\$ 10,200	85	\$ 14,060
Areas	1	\$ 260	4	\$ 800		\$ -		\$ -	40	\$ 5,200		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	40	\$ 6,800	85	\$ 13,060
Floodplain	1	\$ 260	2	\$ 400		\$ -		\$ -		\$ -		\$ -		\$ -	10	\$ 1,700	20	\$ 2,800		\$ -		\$ -		\$ -	33	\$ 5,160
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	12	\$ 3,120	84	\$ 16,800	0	\$ -	0	\$ -	280	\$ 36,400	0	\$ -	0	\$ -	70	\$ 11,900	220	\$ 30,800	0	\$ -	0	\$ -	240	\$ 40,800	906	\$ 139,820

Task 7: Best Management Practices (Conceptual Projects)

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Develop 5 Projects		\$ -	20	\$ 4,000		\$ -	20	\$ 3,400		\$ -	75	\$ 8,250		\$ -		\$ -	20	\$ 2,800		\$ -		\$ -		\$ -	135	\$ 18,450
Include Water Qual/ Quantity		\$ -		\$ -		\$ -		\$ -		\$ 10,400		\$ -	2	\$ 216		\$ -		\$ -		\$ -		\$ -		\$ -	82	\$ 10,616
Interview Staff	4	\$ 1,040	8	\$ 1,600		\$ -		\$ -		\$ -		\$ -	2	\$ 216		\$ -	8	\$ 1,120		\$ -		\$ -		\$ -	22	\$ 3,976
Review Public Land Opportunities		\$ -	8	\$ 1,600	10	\$ 1,400		\$ -		\$ -		\$ -	2	\$ 216	16	\$ 2,720		\$ -		\$ -		\$ -		\$ -	36	\$ 5,936
Modeled Projects (Quality/ Quantity)		\$ -		\$ -	40	\$ 5,600		\$ -		\$ -		\$ -	2	\$ 216		\$ -	80	\$ 11,200		\$ -		\$ -		\$ -	122	\$ 17,016
Results	4	\$ 1,040	16	\$ 3,200	20	\$ 2,800		\$ -	80	\$ 10,400		\$ -		\$ -	40	\$ 6,800		\$ -		\$ -		\$ -		\$ -	160	\$ 24,240
Report/ memorandum		\$ -	8	\$ 1,600		\$ -		\$ -		\$ -		\$ -	16	\$ 1,728		\$ -		\$ -		\$ -		\$ -		\$ -	24	\$ 3,328
EOPCs		\$ -	10	\$ 2,000		\$ -		\$ -	20	\$ 2,600		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	30	\$ 4,600
Online GIS platform		\$ -		\$ -		\$ -		\$ -	15	\$ 1,950		\$ -		\$ -	24	\$ 4,080		\$ -		\$ -		\$ -		\$ -	39	\$ 6,030
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	8	\$ 2,080	70	\$ 14,000	70	\$ 9,800	20	\$ 3,400	195	\$ 25,350	75	\$ 8,250	24	\$ 2,592	80	\$ 13,600	108	\$ 15,120	0	\$ -	0	\$ -	0	\$ -	650	\$ 94,192

Task 8: Cost Benefit Model

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Set up Model	4	\$ 1,040	8	\$ 1,600		\$ -		\$ -	40	\$ 5,200		\$ -		\$ -		\$ -	10	\$ 1,400		\$ -		\$ -		\$ -	62	\$ 9,240
Review projects		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	10	\$ 1,400		\$ -		\$ -		\$ -	10	\$ 1,400
Matrix		\$ -	8	\$ 1,600		\$ -		\$ -	20	\$ 2,600		\$ -		\$ -		\$ -	8	\$ 1,120		\$ -		\$ -		\$ -	36	\$ 5,320
Report		\$ -	16	\$ 3,200		\$ -		\$ -	30	\$ 3,900		\$ -	10	\$ 1,080		\$ -	10	\$ 1,400		\$ -		\$ -		\$ -	66	\$ 9,580
Total	4	\$ 1,040	32	\$ 6,400	0	\$ -	0	\$ -	90	\$ 11,700	0	\$ -	10	\$ 1,080	0	\$ -	38	\$ 5,320	0	\$ -	0	\$ -	0	\$ -	174	\$ 25,540

Task 9: Opportunities to Increase CRS Rating

Task Description	Senior - QA/QC		EOR		Eng/ Drainage		Business Manager		EI		Design/ CAD		Admin Asst		GIS Prof		Senior Eng CFM		Const Inspest		Env Scientist		CRS/ CFM		Total	
	Rate	\$ 260	Rate	\$ 200	Rate	\$ 140	Rate	\$ 170	Rate	\$ 130	Rate	\$ 110	Rate	\$ 108	Rate	\$ 170	Rate	\$ 140	Rate	\$ 120	Rate	\$ 130	Rate	\$ 170		
	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget	Hours	Budget
Review Consultant CRS Optimization		\$ -	4	\$ 800		\$ -	4	\$ 680		\$ -		\$ -		\$ -		\$ -	4	\$ 560		\$ -		\$ -		\$ -	12	\$ 2,040
Meeting Consultant to review report	2	\$ 520	2	\$ 400		\$ -	2	\$ 340		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	6	\$ 1,260
Provide feedback		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Incorporate findings into WMP		\$ -	2	\$ 400		\$ -	2	\$ 340		\$ -		\$ -	4	\$ 432		\$ -	2	\$ 280		\$ -		\$ -		\$ -	10	\$ 1,452
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -		\$ -	-	\$ -
Total	2	\$ 520	8	\$ 1,600	0	\$ -	8	\$ 1,360	0	\$ -	0	\$ -	4	\$ 432	0	\$ -	6	\$ 840	0	\$ -	0	\$ -	0	\$ -	28	\$ 4,752