## CITY OF FAYETTEVILLE WORK AUTHORIZATION FOR PROFESSIONAL SERVICES BY GRADIENT, PLLC

In accordance with the General Services Agreement (Agreement) (Exhibit C) dated <u>April</u> <u>1, 2022</u> between the CITY OF FAYETTEVILLE (hereinafter called OWNER) and <u>GRADIENT</u>, <u>PLLC</u> (hereinafter called CONSULTANT), OWNER hereby authorizes CONSULTANT to proceed and CONSULTANT agrees to perform in accordance with the terms of the Agreement and this Work Authorization, the following services for the following Project:

## I. <u>PROJECT</u>

This Work Authorization is for professional services related to:

### **Bones Creek Watershed Study**

This contract authorizes the Scope of Work shown in Exhibit A, which is hereby attached and incorporated herein by reference. This will be for the hours per task shown in the spreadsheet included as Exhibit B in the not to exceed the total amount shown below.

Funding Mechanism: Stormwater Enterprise Fund

Division/Department Representing the City: Stormwater/Public Services

## II. AGREEMENT & SCOPE OF SERVICE

The terms of the Agreement, attached as Exhibit C, is hereby incorporated by reference as if written herein and the parties confirm that its terms are a part of this Work Authorization.

The Scope of Services to be provided by CONSULTANT, in connection with this Authorization is as follows:

• See Exhibit A for full scope and Exhibit B for hours and costs.

The CONSULTANT shall request written confirmation and or execute an additional Work Authorization describing any scope change before performing any work beyond the scope specified in this Work Authorization. The confirmation shall identify any change in compensation and/or delay in completion which the scope changes entails and must be approved by the City Manager or his designee.

## III. <u>RESPONSIBILITIES</u>

The responsibilities of the OWNER and CONSULTANT, in addition to those provided in the Agreement which are specific to this Project, are as follows:

- Owner
  - Owner, through the PgM, will provide Program data related to the watershed including, but not limited to: Watershed delineation, priority subbasin designation, past and current capital improvement projects, City of Fayetteville legacy infrastructure, historical flood complaints, traffic camera flood data, Watershed InfoWorks ICM results, Citywide hydrologic data, applicable FEMA hydraulic models and other information as described in Exhibit A.
  - Owner will provide prompt review and decisions regarding all submittals
- Consultant
  - As described in Exhibit A

## IV. <u>COMPENSATION</u>

OWNER shall compensate CONSULTANT for providing the services set forth herein in accordance with the terms of the Agreement.

In the absence of a lump sum fee agreement, it is understood and agreed that:

- 1. CONSULTANT will perform under this Agreement on a best effort, not-to-exceed ceiling price basis and will notify OWNER when the ceiling price will be exceeded.
- 2. The not to exceed compensation (including travel) for this Work Authorization is \$574,623.00. This is not a guaranteed maximum amount but CONSULTANT shall not continue performing work in excess of this amount without further specific authorization. OWNER will be billed only for actual time worked and identified expenses.

Payment shall be made in accordance with the terms of the above referenced Agreement.

## V. <u>SCHEDULE</u>

All work under this Work Authorization shall begin upon receipt of fully executed Work Authorization which shall be considered a Notice To Proceed (NTP). CONSULTANT will provide deliverables within nine (9) months of the NTP. A more detailed schedule will be provided prior to issuance of the NTP.

## VI. <u>MISCELLANEOUS</u>

- 1. The terms in this Work Authorization shall have the same meaning as provided in the Agreement.
- 2. As mandated by N.C. Gen. Stat. § 147-86.59(a), CONSULTANT certifies that it is not listed on the Final Divestment List created by the North Carolina State Treasurer pursuant to N.C. Gen. Stat. § 147-86.58. CONSULTANT further certifies that, in accordance with N.C. Gen. Stat. § 147-86-59(b), it shall not utilize any subcontractor found on the State Treasurer's Final Divestment List. CONSULTANT certifies that the signatory to this Work Authorization is authorized by CONSULTANT to make the foregoing statement.
- 3. E-Verify- CONSULTANT acknowledges that "E-Verify" is the federal E-Verify program operated by the U.S. Department of Homeland Security and other federal agencies which is used to verify the work authorization of newly hired employees pursuant to federal law and in accordance with Article 2, Chapter 64 of the North Carolina General Statutes. CONSULTANT further acknowledges that all employers, as defined by Article 2, Chapter 64 of the North Carolina General Statutes. CONSULTANT further acknowledges that all employers, as defined by Article 2, Chapter 64 of the North Carolina General Statutes, must use E-Verify and after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with N.C. Gen. Stat. § 64-26(a). CONSULTANT pledges, attests and warrants through execution of this contract that CONSULTANT complies with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes and further pledges, attests and warrants that any subcontractors currently employed by or subsequently hired by CONSULTANT shall comply with any and all E-Verify requirements. Failure to comply with the above requirements shall be considered a breach of this Work Authorization.
- 4. Force Majeure- Neither party shall be deemed to be in default of its obligations hereunder if and *so long as* it is prevented from performing such obligations by an act of war, hostile foreign actions, adverse governmental actions, nuclear explosion, earthquake, hurricane, tornado, or other catastrophic natural event or act of God.

- 5. Morality Clause- If, in the sole opinion of the City of Fayetteville, at any time CONSULTANT or any of its owner(s) or employee(s) or agent(s) (collectively referenced as an "Actor") engages in any one or more actions that bring disrepute, contempt, scandal, or public ridicule to the Actor or subject the Actor to prosecution or offend the community or public morals or decency or denigrate individuals or groups in the community served by the City of Fayetteville or are scandalous or inconsistent with community standards or good citizenship or may adversely affect the City of Fayetteville's finances, public standing, image, or reputation or are embarrassing or offensive to the City of Fayetteville or may reflect unfavorably on the City of Fayetteville or are derogatory or offensive to one or more employee(s) or customer(s) of the City of Fayetteville, the City of Fayetteville may immediately upon written notice to CONSULTANT terminate this Agreement, in addition to any other rights and remedies that the City of Fayetteville may have hereunder or at law or in equity.
- 6. Venue and Forum Selection- The Parties expressly agree that if litigation is brought in connection with this contract and (1) the litigation proceeds in the Courts of the State of North Carolina, the parties agree that the appropriate venue shall be in Cumberland County (Twelfth Judicial District of North Carolina); or (2) the litigation proceeds in a federal court, the parties agree that the appropriate venue shall be the United States District Court for the Eastern District of North Carolina
- 7. Termination for Cause- In the event of substantial failure by CONSULTANT to perform in accordance with the terms of this contract, City of Fayetteville shall have the right to terminate CONSULTANT upon ten calendar (10) days written notice in which event CONSULTANT shall have neither the obligation nor the right to perform further services under this contract nor shall the City of Fayetteville be obligated to make any further payment for work that has not been performed.
- 8. Termination for Convenience- Upon thirty (30) calendar days' written notice to CONSULTANT, the City of Fayetteville may, without cause and without prejudice to any other right or remedy legally available to the City of Fayetteville, terminate this Contract. Upon such notice, CONSULTANT shall have neither the obligation nor the right to perform services under this contract nor shall the City of Fayetteville be obligated to make any further payment for work that has not been performed in accordance with the terms stated herein. In such case of termination, CONSULTANT shall be paid for the completed and accepted work executed in accordance with this Contract prior to the written notice of termination. Additionally, upon mutual agreement, CONSULTANT may be paid for any completed and accepted work which takes place in order to achieve a specifically identified item in the scope of services or a milestone of the Contract, between the written notice of termination and the

effective date of termination. Unless otherwise stated or agreed upon, the effective date of termination shall automatically occur 30 days' after the written notice is sent by the City of Fayetteville.

- 9. Protest Protest related to this procurement must be addressed to the Purchasing Manager for City of Fayetteville, 433 Hay St, Fayetteville, NC 28301 and shall be received, in writing, within 2 calendar days of bid award. Responses will be in writing by email and first-class mail not later than (7) calendar days following receipt of said protest by the Purchasing Manager.
- 10. To the extent permitted by law, CONSULTANT agrees to defend, indemnify, and hold harmless the City of Fayetteville and its elected officials, employees, agents, successors, and assigns, from any and all liability and claims for any injury or damage caused by any act, omission or negligence of CONSULTANT, its agents, servants, employees, contractors, licensees, or invitees. Indemnification of the City by CONSULTANT does not constitute a waiver of the City's governmental immunity in any respects under North Carolina law.
- 11. <u>CITY'S TERMS SUPERSEDE:</u> To the extent a conflict exists between the terms of this Agreement and the terms and conditions in any of the attachments to the Agreement, the terms of this Agreement shall govern.

[Signature page to follow]

## CONSULTANT ACCEPTANCE:

GRADIENT, PLLC

BY: Gordon A. Rose

TITLE: Member/Manager

DATE: May 18, 2022

## AUTHORIZATION BY:

CITY OF FAYETTEVILLE

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Jay Toland, Assistant City Manager/ Chief Financial Officer

## EXHIBIT A

# SCOPE OF WORK

## EXHIBIT A Phase I Watershed Study for *Bones Creek* Scope of Services

#### **PROJECT DESCRIPTION**

#### **GENERAL OVERVIEW**

This scope of services is a summation of Phase I work to be performed in high priority sub-basins, as defined by the Program Manager (PgM), in the Bones Creek Watershed. It includes detailed hydrologic and hydraulic analysis for a total drainage area of approximately 2.0 square miles and total stream length of approximately 5.2 river miles. Figure 1 shows the study area indicating the streams and pipe systems that will be analyzed. All project management and modeling shall follow the most current version of the City of Fayetteville Consultant Management and Standards Manual (CMSM) to be provided by the PgM. This scope includes the following tasks:

- Task 1 Project Management and Meetings
- Task 2 Data Collection and Field Survey
- Task 3 Detailed Hydrologic Analysis
- Task 4 Detailed Hydraulic Analysis
- Task 5 Stream Assessment
- Task 6 Identify Concern Areas and Proposed Solutions

**BASIC SERVICES:** Consultant will provide the following basic services for the Study area. In the performance of these services all standards for project management, reporting and technical tasks will be in conformance with the latest addition of the CMSM. If additional effort is required as a result of the CMSM being modified after a contract is executed, the consultant shall notify the PgM of the additional services needed prior to incurring that effort.

#### Task 1 – Project Management and Meetings

- 1. **Project Management** Consultant will prepare a Microsoft Project schedule, provide monthly reporting updates, including notification of any out-of-scope work, and coordinate with FNI as the Program Manager per the CMSM.
- 2. Progress Meetings Consultant will conduct monthly, one-hour long, virtual progress meetings with City and PGM staff for a total of 9 meetings. Meeting notes will be provided by the Consultant within one week of the meeting. As necessary, weekly phone calls will also be held to discuss items considered critical or urgent. The monthly meetings, which include quality reviews as outlined in the CMSM, will include the major milestones listed below:
  - i. Kickoff and data collection meeting
  - ii. Discuss concern areas and recommendations for proposed solutions

#### Task 2 – Data Collection and Field Survey

#### 1. Data Collection

- i. The PgM will provide City Data including roads, parcels, building footprints, and land use data.
- ii. The PgM will provide State and National Data including, topographic data, flood risk dataset, and soils data for relevant watersheds.

- iii. The PgM will provide Program data related to the watershed including, but not limited to: Watershed delineation, priority subbasin designation, past and current capital improvement projects, City of Fayetteville legacy infrastructure, historical flood complaints, traffic camera flood data, Watershed InfoWorks ICM results, Citywide hydrologic data, and applicable FEMA hydraulic models.
- The PgM will provide the first Quality Checklist confirming the data sent. The Consultant will review the Quality Checklist to determine if the limits of the study are sufficient for the watershed analysis. If sections or required data appear to be missing, this will be documented and the PgM will be notified.
- v. Consultant will conduct site visits to document the limits of the study and to document initial conditions with photographs. Note: the most useful photos will be uploaded to the SharePoint site. Should the City's SharePoint site not be operational at the time of the scheduled delivery, Consultant will provide deliverables via electronic delivery method (SP site, OneDrive, FTP link, etc.). Noted discrepancies will be provided to the PgM.
- vi. Prepare base map of existing conditions including streams, road crossings, hydraulic features, drainage areas, topography, storm drain network and aerial photos.
- vii. Any additional data collected throughout the study process will be collected, processed, and delivered as indicated in relative sections of the CMSM.
- Field Survey Initial field survey for riverine and pipe systems will be collected by the PgM according to the CMSM. Upon initial model development, critical spill over locations or any additional survey requests shall be supplied by consultant to the PgM for supplementary survey collection as appropriate.

#### ASSUMPTIONS:

- The consultant will perform an initial review of the survey data prior to the model build effort and will summarize any possible omissions and errors. This information will be provided to the PgM.
- 3. Moderate- and High-Hazard Road Crossing Condition Assessment A condition assessment of all moderate- and high-risk road crossings within the assigned watershed, provided by the PgM, will be performed by the Consultant according to the CMSM. The City's existing stormwater infrastructure file and standard video guidelines and procedures are to be used as reference.
  - i. Assume that culverts over 60 inches will be walked, culverts between 24 and 60 inches will use a pole cam and anything smaller will be visually inspected externally; standard Closed Circuit Television (CCTV) procedures may be utilized after coordination with the PgM.
  - ii. Provide a report that includes type, size, and high-level condition assessment rating of the pipe, as well as the embankments on either end of the culverts as detailed in the CMSM. If a structure located within a priority sub-basin rates as poor, it will be identified as a concern area and the CMT will be notified. If a structure located outside of a priority sub-basin rates poor, then the CMT will be notified, and any additional work will be scoped as part of Phase II.

#### ASSUMPTIONS:

• There are no moderate or high hazard crossings in Bones Creek Watershed.

#### Task 3 – Detailed Hydrologic Analysis

This phase includes the use of Infoworks ICM to further develop current hydrologic models developed by the PgM for existing conditions within the Study Area. It is anticipated that the priority sub-basins will need to be further divided into smaller subcatchments in ICM for more detailed hydraulic analysis of pipe and open channel systems. An overall review of

the HMS model is not to be included as part of this analysis. This task may include consolidated and concise revisions to the existing HEC-HMS model provided to the Consultant by the PgM.

#### 1. Hydrologic Modeling Updates

- i. Revise existing sub-basins as appropriate for the Secondary System infrastructure being modeled for the study area.
- ii. Divide the Citywide subbasins into subcatchments as appropriate for ICM modeling
- iii. Define model input parameters for the study area that includes the following:
  - i. Review and update the land use data based on latest aerial imagery,
  - ii. Compute updated curve numbers as applicable
  - iii. Calculate times of concentration for each ICM subcatchment
- iv. Input subcatchments, model parameters, rainfall and inflow hydrographs into ICM.
- v. Document and update significant changes in HMS subbasin parameters. Thresholds for significant change that requires specific documentation is defined in the CMSM and Quality Checklist.
- vi. Modify the existing HEC-HMS subbasin parameters to reflect the significant changes and adjust the routing values where appropriate based on ICM model results.

#### ASSUMPTIONS:

- Up to 15 HMS subbasins consisting of up to 400 catchments
- 7 inflow points each with 8 different rainfall hydrographs (includes 2 historic rainfall events based on data provided by the City)
- Adjustments to the existing HEC-HMS model will only be made after the ICM model hydraulics are completed.
- Adjustments to the routing parameters within the HEC-HMS model will only be made when multiple subbasin areas combined can be compared directly to the ICM model results

#### 2. QA Meetings

QA meetings will e held with the CMT. PgM will provide comments via the Quality Checklist prior to the first QA meeting. Consultant will lead the meeting, describing the steps taken, assumptions made and derivation from CMSM methodology. It is anticipated one (1) Hydrologic QA meeting will be required for this watershed. After the QA meetings, the Consultant will provide the Quality Checklist back to the PgM with responses.

#### 3. Deliverables

- i. Quality Checklist
- i. Deliverables as outlined in the CMSM and Quality Checklist
- ii. Develop a report chapter summarizing the methodology and results of the hydrologic analysis and submit for review.
- iii. All GIS information used as part of the analysis, including all data supplied by the PgM, will be turned into the City in the appropriate format as specified in the CMSM. The files should be clipped to the relevant watershed.
- iv. Submit an electronic copy in pdf format of the updated report to the PgM for review.
- v. Submit electronic copies of any updated hydrologic models for review.
- vi. PgM comments will be incorporated in the final products and report.

#### Task 4 – Detailed Hydraulic Analysis

This phase includes the development of hydraulic models representing existing conditions geometry with existing condition discharges. An inundation map(s) showing inundation extents for the storm events identified in the CMSM will be created and concern areas along with flooded structures will be identified.

Primary systems are defined as open channel riverine locations with defined FEMA floodplains or blue lines on a USGS quad map. Secondary systems are defined as upland streets, ditches, and/or pipe systems within the assigned sub-basin.

At a minimum, all Primary Systems within assigned sub-basins will be modeled in HEC-RAS using a 1D steady state approach, and all Secondary Systems within the assigned sub-basins will be analyzed using a 2D approach within InfoWorks ICM modeling software

- 1. **HEC-RAS Steady State Hydraulic Modeling** The following stream names and reaches will be studied using a 1D HEC-RAS Steady State approach.
  - Bones Creek Tributary A– From the upstream limit of the effective FEMA model to 2,600 feet upstream (Estimated at 6,000 feet).
  - Bones Creek Tributary A1 From 1,600 feet downstream of English Saddle Drive to City Limits (Estimated at 11,500 feet).
  - Bones Creek Tributary A2 From the confluence with Bones Creek Tributary A2 to the City storm drainage system outfall (Estimated at 2,600 feet).
  - Bones Creek Tributary B From the confluence with Bones Creek to the City storm drainage system outfall (Estimated at 2,800 feet)
  - Bones Creek Tributary C From the confluence of Bones Creek to the City storm drainage system outfall (Estimated at 4,600 feet)
  - i. Develop new HEC-RAS Steady hydraulic model or augment the latest FEMA model if applicable
  - ii. Update channel and pond routings in hydrologic model.
  - iii. Determine the existing condition water surface elevations for the streams within the study area for all the storm events specified in the CMSM.
  - iv. Develop existing condition inundation extents for storm events listed in the CMSM within the stream study limits.
  - v. Perform model validation. Rainfall hyetographs for two historic storm events will be provided by the City and required for use in validation. Three representative design storms will also be provided by the City and may also be used to inform the validation, but are not required.
  - vi. Identify concern locations and flood prone areas, as defined in the CMSM, and document existing condition's structure overtopping (road crossings) and degree of potential flooding (structures).
  - vii. Identify areas within the studied reach that will require additional 2D or Unsteady State modeling, as indicated by the results of the previous items.
- 2. HEC-RAS Unsteady and 2D Hydraulic Modeling (NOT APPLICABLE) The following stream names and lengths will be studied using a HEC-RAS Unsteady and/or 2D as specified below.

#### > There are no unsteady or 2D primary stream models

- i. Develop new HEC-RAS Unsteady/2D model for study area or augment the latest FEMA model if applicable.
- ii. Develop boundary conditions diagram for study area.
- iii. Determine the existing condition water surface elevations for the streams within the study area for the storm events specified in the technical standards.
- iv. Develop existing conditions inundation extents for storm events listed in the CMSM within the stream study limits.

- v. Perform model validation. Rainfall hyetographs for two historic storm events will be provided by the City and required for use in validation. Three representative design storms will also be provided by the City and may also be used to inform the validation, but are not required.
- Secondary System 1D Modeling The following systems, general locations, and lengths will be studied using 1D\* Dynamic Modeling as specified below.

#### > There are no secondary system 1D models

- i. Develop a new dynamic model for each system listed above based on recently collected infrastructure data, GIS, as-built record drawings, and LIDAR data.
- ii. Verify inlets, outlet pipes for the entire system as described above,
  - a. Ask to acquire survey data where needed to correct seemingly erroneous data.
- iii. Develop a system-specific modeling approach (inlets grouped or modeled individually, trunkline only or full storm drain network, etc.) and provide justification for the approach. PgM will review the approach before work is underway.
- iv. Where the system is surcharged and the overflow path is known and unidirectional, add links and nodes to represent the overland flow and document the source of the link geometry.
- v. All hydrograph routing will be performed within the dynamic modeling software package.
- vi. Develop flow loading diagram for system.
- vii. Determine the existing condition water surface elevations within the system study area where flow is not contained by the storm drain system for the storm events specified in the technical standards.
- viii. Develop the existing conditions 100-year flood extents within the system study limit, where flow leaves the ROW or existing easements.
- ix. Perform model validation. Rainfall hyetographs for two historic storm events will be provided by the City and required for use in validation. Three representative design storms will also be provided by the City and may also be used to inform the validation, but are not required.

\* 1D modeling is preferred where initial analysis shows flows are unidirectional and contained within +/- 10 feet of the Right-of-Way.

- Secondary System 2D Modeling The following systems, general locations, and lengths will be studied using 2D\* Dynamic Modeling as specified below.
  - BON\_0432 Approximately 4,400 feet of neighborhood drainage system with 16 catchments and 30 links.
  - BON\_0415 Approximately 14,700 feet of neighborhood drainage system with 64 catchments and 100 links.
  - BON\_0403/0404/0426 Approximately 25,000 feet of neighborhood drainage system with 64 catchments and 170 links.
  - BON\_0434/0407 Approximately 10,000 feet of neighborhood drainage system with 36 catchments and 75 links.
  - BON\_0409/0410 Approximately 15,000 feet of neighborhood drainage system with 50 catchments and 100 links.
  - BON\_0426/0601 Approximately 4,500 feet of neighborhood drainage system with 35 catchments and 60 links.
  - BON\_0704/0705/0707 Approximately 25,000 feet of neighborhood drainage system with 105 catchments and 240 links.

- BON\_1104 Approximately 9,000 feet of neighborhood drainage system with 30 catchments and 60 links.
- i. Develop a system-specific modeling approach (inlets grouped or modeled individually, trunkline only or full storm drain network, etc.) and provide justification for the approach. PgM will review the approach before work is underway.
- ii. Consultant will conduct a desktop assessment of the field survey data collected as described under Task 2.1 above. In addition, consultant will conduct limited site visits to field check inlets and outlet pipes within the system. If discrepancies and/or errors are noted in the survey data provided, Consultant will notify the PgM of the apparent error and request updated survey data be provided. No provision has been made in this proposal for conducting additional field survey services.
- Develop a new dynamic model for each system listed above based on recently collected infrastructure data,
   GIS, as-built record drawings, and LIDAR data.
  - a. All hydrograph routing will be performed within the dynamic modeling software package.
- iv. Where the system is surcharged and the overflow path is known and multidirectional, add 2D Zones to represent the overland flow. Final 2D Zone extents should fully encompass the highest level of flooding produced by the hydrology. 2D Zones that spread shallow flow across a known floodplain may be terminated with a boundary condition within 10 feet or 2 2D elements of the receiving stream bankline.
- v. Develop flow loading diagram for system.
- vi. Determine the existing condition water surface elevations within the system study area where flow is not contained by the storm drain system for all the storm events specified in the CMSM.
- vii. Develop existing conditions inundation extents for storm events listed in the CMSM within the system study limits.
- viii. Perform model validation. Rainfall hyetographs for two historic storm events will be provided by the City and required for use in validation. Three representative design storms will also be provided by the City and may also be used to inform the validation, but are not required.

\* 2D modeling is preferred where initial analysis shows flows are multidirectional and uncontained within +/- 10 feet of the Right-of-Way.

#### 5. Hydrologic Modeling Updates

- i. Determine the existing discharges for the study area for the storm frequencies defined in the CMSM using updated hydrologic parameters.
- ii. Compare InfoWorks ICM peak flow values to HEC-HMS values and provide comparison table for PgM review to determine if HEC-HMS model revisions are warranted.
- iii. As needed and coordinated with the PgM, update existing conditions hydrologic models in HEC-HMS for the study area based on the procedure outlined in the CMSM to reflect more detailed parameter information developed for the new analysis.

#### 6. QA Meetings

QA meetings will be held with the CMT. PgM will provide comments via the Quality Checklist prior to the first QA meeting. Consultant will lead the meeting, describing the steps taken, assumptions made and derivation from CMSM methodology. It is anticipated two (2) QA meetings will be required for this watershed. After the QA meetings, the Consultant will provide the Quality Checklist back to the PgM with responses.

#### 7. Deliverables

- i. The Quality Checklist
- ii. Deliverables as outlined in the CMSM and Quality Checklist
- iii. Updated HMS models, model parameter shapefiles and report sections to finalize the hydrologic analyses performed in Task 3.
- iv. Develop a report chapter summarizing the methodology and results of the hydraulic analysis that includes inundation mapping as appropriate to depict model results.
- v. Results shall be provided that include tabulated depth of flooding, WSEL, and velocity at key locations, along with any special or area specific information. This should include the ICM transportable and results geodatabases.
- vi. All GIS information updated and/or created as part of the project, including inundation extent files for storm events listed in the CMSM, will be turned into the City in the appropriate format as specified in the CMSM.
- vii. Submit an electronic copy in pdf format of the draft chapter(s) to PgM for review.
- viii. Submit electronic copies of the Primary and Secondary System hydraulic models for review.
- ix. PgM comments will be incorporated in the final report.

#### Task 5 - Stream Assessment

In preparation for the hydraulic analyses in high priority sub-basins on or near USGS blue line streams, the Consultant will perform a basic stream field assessment that could include rapid geomorphic assessment and reach characterization methodologies and procedures. We have identified the blue line streams that the priority basins drain to and have extended them downstream to Lake Rim (Figure 2). Total lengths for each blueline segment (3 segments) is approximately 22,800 linear feet and the portion within the high priority subbasins (4 segments) is approximately 7,200 linear feet. We assume the field work would assess the entire blueline segments identified to include downstream issues that might have negative impacts due to proposed projects.

#### 1. Desktop Analysis

- i. Consultant will perform a desktop analysis of the channel stability and evolution based on soils, geology, topography, and landscape using literature and historical aerial photographs.
- ii. The desktop analysis will include a review of condition assessment data collected as part of Task 2. An assessment including field review and evaluation will be conducted if:
  - Significant erosion is noted
  - A reach is listed as a 303(d) stream
  - A reach is in a Water Supply watershed

#### 2. Field Reconnaissance

- i. Consultant will investigate selected study reaches, as agreed upon with the CMT, using field reconnaissance techniques for stream geomorphic assessments. This will be achieved by walking the channel and making observations as described herein, including developing a reach-specific naming protocol and GIS map. The reach naming protocol will be coordinated with, or will utilize, naming protocols for other portions of this Scope of Services and will be specifically coordinated with the H&H modeling team.
- ii. Field observations will include a general characterization of channel morphology (pools, bars, riffles, benches) and a visual summary of the channel conditions by stream reach (photographs and GIS mapped locations based on mapping grade GPS coordinates gathered in the field). The intent of this task is to establish a basic understanding of the existing conditions of the stream reaches to assess their potential for stabilization or degradation (this initial assessment is high level and should indicate the channel's stage of succession (eg: trending stable, trending to incision or aggradation).

- iii. Locations of current and possible bank failures including erosion and incision (slumps and knickpoints,), areas of channel aggradation and degradation, and debris dams will be documented with mapping grade GPS.
- iv. During the stream assessment the sediment sources (i.e. severely eroded banks) and discharge areas (i.e. storm drain outfalls) will be noted as well as nick points (bedrock or manmade structures) within the creek and the distance to and type of structure. Threatened infrastructure (public infrastructure, private homes, fences, etc.) will be documented. All locations will be GPS photographed.

#### 3. Intensive Field Investigation (Special Services)

- i. Consultant will present areas that may require the use of Special Services upon approval from the CMT.
- ii. The start and stop locations of erosion areas along streambanks and the streambed that are near infrastructure should be identified and recorded.
- iii. Detailed erosion will be determined utilizing BEHI methods described in the CMSM and should be documented for modeling.
- iv. Channel dimensions will be measured with a survey rod and digital range finder to determine bank geometry.
- v. Bed material gradation will be approximated by collecting a single Wolman pebble count at a representative riffle of the study reach.
- vi. Intensive Field Investigation is not included in the fee proposal at this time.

#### 4. QA Meetings

QA meetings will be held with the CMT. PgM will provide comments via the Quality Checklist prior to the first QA meeting. The Consultant will lead the meeting, describing the steps they took, assumptions made and the results of the assessment, focusing on high hazard erosion concern areas. It is anticipated one (1) QA meetings will be required for this watershed. After the QA meetings, the Consultant will provide the Quality Checklist back to the PgM with responses.

#### 5. Deliverables

- i. Quality Checklist
- ii. Deliverables as outlined in the CMSM and Quality Checklist
- iii. Develop a memo summarizing the methodology and results to determine if further analysis is needed.
- iv. Field data, photos, and desktop calculations will be included in the memo and submitted as an electronic copy in pdf format for PgM review.
- v. GIS information updated and/or created as part of the project will be turned into the City in the appropriate format as specified in the CMSM.
- vi. One round of PgM comments will be incorporated in the finalized memo based on agreed upon responses.

#### Task 6 – Identify Concern Areas and Proposed Solutions

This phase includes the identification and documentation of flooding and erosion concern areas. A quantitative and qualitative analysis will be done for each concern area and reviewed with the City.

- Identify and Document Concern Areas Based on the results of the detailed hydrologic and hydraulic analysis, Consultant will identify flooding and erosion concern areas as described in CMSM 2.06 and document existing condition structure overtopping (road crossings). The tables in this section will be populated for each concern area identified and a cross check will be performed.
- 2. Qualitative Analysis All concern areas require a qualitative analysis as outlined in the CMSM.

3. Scoring and Categorizing Concern Areas and Identifying the Need for Proposed Solutions – Concern areas will be scored, weighted, and categorized as high, medium, or low severity.

#### 4. QA Meetings

QA meetings will be held with the CMT. PgM will provide comments via the Quality Checklist prior to the first QA meeting. The Consultant will lead the meeting, describing the steps they took, assumptions made and the results of the assessment, focusing on high hazard erosion concern areas. It is anticipated two (2) meetings will be required for this watershed. After the QA meetings, the Consultant will provide the Quality Checklist back to the PgM with responses.

#### 5. Deliverables

- i. Quality Checklist
- ii. Deliverables as outlined in the CMSM and Quality Checklist (including report section, GIS information, tables, and exhibits)
- iii. Concern Area Workbook in excel format
- iv. Submit an electronic copy in pdf format of the draft chapter(s) to CMT for review.
- v. CMT comments will be incorporated in the final report.

#### ASSUMPTIONS:

- Thirty (30) concern areas will be identified and scored and a qualitative analysis performed
- Four (4) stream concern areas will be identified

**SPECIAL SERVICES**: During the above-described tasks, additional tasks, assistance, or other needs may be identified. Should additional needs be identified which fit the general description of Watershed Studies identified herein, the City may authorize use of Special Services and/or negotiate additional Work Authorizations to complete those tasks. Specific tasks may include, but not be limited to:

- 2D RAS modeling
- Additional secondary system 2D areas requiring modeling in excess of the assumptions included
- Public outreach or public outreach planning
- Items related to the risk register
- Phase II activities (if Phase II has started but the contract is not yet executed)
- Stream Assessment Intensive Field Investigation

## EXHIBIT B

# FEE ESTIMATE

Task and Description								
		Gradient		HDR		Woolnert	P	roject Total
Task 1: Project Management		Gradient		TIER		wooipert		oject rotai
1. Project Management	\$	8,325.00	\$	11,520.00	\$	-	\$	19,845.00
2. Meetings	\$	11,240.00	\$	11,955.00	\$	-	\$	23,195.00
Task 2: Data Collection and Field Survey								
1. Data Collection	\$	6,620.00	\$	5,765.00	\$	-	\$	12,385.00
2. Field Survey	\$	3,290.00	\$	3,160.00	\$	-	\$	6,450.00
3. Road crossing condition assessment	\$	-	\$	-	\$	-	\$	-
Task 3: Detailed Hydrologic Analysis			-		-		-	
1. Hydrologic Model Updates	\$	-	\$	65,560.00	\$	-	\$	65,560.00
2. QA Meeting	\$	1,050.00	\$	1,950.00	\$	-	\$	3,000.00
3. Deliverables	\$	2,410.00	\$	15,730.00	\$	-	\$	18,140.00
Task 4: Detailed Hydraulic Analysis		-	-		-		-	
1. HEC-RAS Steady State Hydraulic Modeling	\$	660.00	\$	55,850.00	\$	-	\$	56,510.00
2. HEC-RAS Unsteady and 2D Hydraulic Modeling	\$	-	\$	-	\$	-	\$	-
3. Secondary System 1D Modeling	\$	-	\$	-	\$	-	\$	-
4. Secondary System 2D Modeling	\$	5,830.00	\$	148,520.00	\$	-	\$	154,350.00
5 Hydrologic Modeling Updates	\$	-	\$	8,780.00	\$	-	\$	8,780.00
6. QA Meeting	\$	1,050.00	\$	3,900.00	\$	-	\$	4,950.00
7. Deliverables	\$	3,980.00	\$	33,875.00	\$	-	\$	37,855.00
Task 5: Field Assessment								
1. Desktop Analysis	\$	1,400.00	\$	-	\$	11,106.00	\$	12,506.00
2. Field Reconnaissance	\$	5,180.00	\$	-	\$	20,346.00	\$	25,526.00
3. Intensive Field Investigation (Special Services)	\$	-	\$	-	\$	-	\$	-
4. QA Meeting	\$	885.00	\$	560.00	\$	1,650.00	\$	3,095.00
5. Deliverables	\$	2,100.00	\$	-	\$	11,146.00	\$	13,246.00
Task 6: Identify Concern Areas								
1. Identify Concern Areas and the Need for Flood Risk Reduction	\$	2,100.00	\$	5,200.00	\$	-	\$	7,300.00
2. Qualitative Analysis	\$	700.00	\$	6,320.00	\$	-	\$	7,020.00
3. Scoring, Categorizing, Identifying need for solution	\$	-	\$	11,800.00	\$	-	\$	11,800.00
4. QA Meeting	\$	1,050.00	\$	3,900.00	\$	-	\$	4,950.00
5. Deliverables	\$	3,590.00	\$	16,520.00	\$	-	\$	20,110.00
Expenses	\$	750.00	\$	1,000.00	\$	4,000.00	\$	5,750.00
Base Total	\$	62,210.00	\$	411,865.00	\$	48,248.00	\$	522,323.00
Contingency: Special Services (10%)							\$	52,300.00
							Ċ.	F74 (22 05
Project Total	1						Ş	574,623.00

## Exhibit B - Gradient Fee Estimate: Bones Creek

Task 1.C. Public Involvement	
Task 2.A.2. Review Reports and As-Builts	
HMS Model Update and Deliverables	
Task 5: Intensive Field Assessment	

	Gradient - Bones Creek												
Item Number	Description		Senior Project		Gradier	nt					Combi	ned Totals (CT)	
		Principal \$185.00	Manager \$165.00	Project Manager \$145.00	Project Engineer \$125.00	Designer \$110.00	Tech. I \$75.00	Tech II \$95.00	Admin \$75.00	Hours	Labor	Expense	Total
Task 1: Project 1. Project	Management	45.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.0	\$8,325.00		\$8,325.00
	i. Project schedule management ii. Monthly reporting updates including out-of-scope work iii. conditiation with FNI	15 15								15.0 15.0	\$2,775.00 \$2,775.00 \$2,775.00		\$2,775.00 \$2,775.00 \$2,775.00
2. Meetin	gs i. Conduct monthly progress meetings	34.0 16	30.0 12	0.0	0.0	0.0	0.0	0.0	0.0	64.0 28.0	\$11,240.00 \$4,940.00		\$11,240.00 \$4,940.00
	ii. Include quality review as milestones listed below a. kickoff and data collection meeting	2	2							0.0 4.0	\$0.00 \$700.00		\$0.00 \$700.00
Task 2: Data Co	b. Discuss concern areas and draft project concepts 2. Weekly phone calls lection and Field Survey	6 10	ь 10							20.0	\$2,100.00		\$2,100.00 \$3,500.00
1. Data Co	silection i. Review GIS information provided by City	23.0	9.0 4	0.0	0.0	8.0	0.0	0.0	0.0	<b>40.0</b> 4.0	\$6,620.00 \$660.00		\$6,620.00 \$660.00
	Obtain and review previous study, reports, and as-built data     Exercise w program data and FEMA models. Request Preliminary FEMA models	2	2							2.0	\$370.00 \$330.00		\$370.00 \$330.00
	IV. Review & update update update the construction of the construc	2 2 16	-			4				2.0	\$370.00		\$370.00 \$370.00 \$3.400.00
2. Field Su	vii. Prepare base map of existing conditions nvey	1 16.0	2 2.0	0.0	0.0	4 0.0	0.0	0.0	0.0	7.0 18.0	\$955.00 <b>\$3,290.00</b>	0	\$955.00 <b>\$3,290.00</b>
3. Modera	Review Field Survey Information     team of the sessment     Indexten and here here in a condition assessment	16 0.0	2	0.0	0.0	0.0	0.0	0.0	0.0	18.0 0.0	\$3,290.00 \$0.00	0	\$3,290.00 \$0.00
Task 3: Detaile	Hydrologic Analysis									0.0	\$0.00		\$0.00
1. Hydrole	ogic Model Updates I. Revise the existing subbasins boundaries where necessary based on survey data	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00		\$0.00 \$0.00
	ii. Split up subbasism for ICM catchments     iii. Define model input parameters     // input catchments into ICM model and perfrom internal OC									0.0	\$0.00 \$0.00 \$0.00		\$0.00 \$0.00 \$0.00
	v. Summarize significant changes in the HMS subbasin parameters. vi. Modify existing HMS model subbasisns parameters where significant changes occur.									0.0	\$0.00		\$0.00 \$0.00
2. QA Me	vii. Modify existing HMS model routing parameters after ICM model is complete eting to a Model routing and the second sec	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 6.0	\$0.00 \$1,050.00		\$0.00 \$1,050.00
3. Deliver	I. UA Weenig II. Quality Checklist to PgM ables	1	1 9.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0 14.0	\$350.00		\$350.00 \$350.00 \$2,410.00
	<ol> <li>Develop the chapter(s) of the report summarizing the hydrologic analysis and methodolgy ii. Complete the Project Quality Checklist</li> </ol>	2	4							6.0 2.0	\$1,030.00 \$370.00		\$1,030.00 \$370.00
	iiii. Compile GIS support information     ivo Submit Report, Checklist, GIS information, ICM model, and HEC-HMS model for review     w programmatic ADM compared into model reasond to comments on checklist, undate the report accordingly.	1	2							2.0 2.0 2.0	\$330.00 \$350.00 \$330.00		\$330.00 \$350.00 \$330.00
Task 4: Detaile 1. HEC-RA	Hydraulic Analysis S Steady State Hydraulic Modeling	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	\$660.00		\$ <u>660.00</u>
	Develop new HEC-RAS Steady hydraulic model or augment the latest FEMA model if applicable     Jobate channel and pond routings in hydrologic model     Develop the antiperiod state of the data statest of the statest fema.									0.0	\$0.00		\$0.00 \$0.00
H=	III. Determine the water surface elevations for the streams for existing storm events Iv. Develop the inundation extents for existing storm events v. Perform model validation using results from two historic rainfall hvetographs (discuss results with Core Team)		2							0.0 2.0 0.0	\$0.00 \$330.00 \$0.00		\$0.00 \$330.00 \$0.00
E-	vi. Identify concern locations and flood prone areas vii. Identify areas within the studied reach that will require additional 2D or Unsteady State modeling		2							2.0	\$330.00		\$330.00
2. HEC-RA	S Unsteady and 2D Hydraulic Modeling I. Develop new HEC-RAS Unsteady/2D model for study area or augment the latest FEMA model if applicable I. Develop heurdna: concellater diagram for study area	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00		\$0.00 \$0.00
	iii. Develop boundary conditions diagram for study area     iiii. Develop boundary conditions diagram for study area     iiii. Develop the water surface elevations for the existing conditions     iv. Develop the 100-year inundation extents for existing storm events									0.0	\$0.00		\$0.00
3. Second	v. Identify concern locations and flood prone areas ary System 1D Modeling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 <b>\$0.00</b>		\$0.00 <b>\$0.00</b>
	I. Field verify inlets, outlet pipes for the entire system     II. Develop a system-specific modeling approach and provide justification     III. Develop as and nodes to represent overland flow, dorument source									0.0	\$0.00 \$0.00		\$0.00 \$0.00 \$0.00
	iv. Develop flow loading diagram for system									0.0	\$0.00		\$0.00
	v. Determine the water surface elevations where flow is not contained by the storm drain system for existing storm events vi. Develop the inundation extents within the system study limits for existing storm events									0.0	\$0.00		\$0.00 \$0.00
4. Second	VIII. Identity concern locations and flood prone areas ary System 2D Modeling II. Develop a system specific modeling appraoch and submit to PEM	22.0	4.0	0.0	0.0	10.0	0.0	0.0	0.0	36.0 2.0	\$5,830.00 \$330.00		\$0.00 \$5,830.00 \$330.00
	ii. Verify inlets iii. Develop the ICM model for each storm drainage system based on survey data, LIDAR data, and as-builts	20	-			10				30.0 0.0	\$4,800.00		\$4,800.00 \$0.00
	iv. Where the system is surcharged and the overflow path is known and multidirectional, add 2D Zones to represent the overfand flow.	-								0.0	\$0.00		\$0.00
	v. Develop now loading diagram for system vi. Determine the water surface elevations where flow is not contained by the storm drain system for existing storm events									0.0	\$0.00		\$0.00
	vii. Develop the inundation extents for existing storm events viii. Perform model validation for two historic storm events and review results with the City									0.0	\$0.00 \$0.00		\$0.00 \$0.00
5 Hydrolo	Viii. Identify concern locations and flood prone areas gic Modeling Updates II: Determine existing discharges at HMS subhasin locations	2 0.0	2 0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0 0.0	\$700.00 \$0.00		\$700.00 \$0.00 \$0.00
	ii. Compare ICM peak flows to HMS values and generate comparison table for review iii, Update the existing HEC-HMS model to better reflect the ICM model results												
6. QA Me	i. QA Meeting	3.0	3.0	0.0	0.0	0.0	0.0			0.0	\$0.00		\$0.00 \$0.00
7. Deliver	II. Quality Checklist to PgM		2					0.0	0.0	0.0 0.0 6.0 4.0	\$0.00 \$0.00 \$1,050.00 \$700.00		\$0.00 \$0.00 <b>\$1,050.00</b> \$700.00
	i. Complete the Project Quality Checklist	1 12.0 2	2 1 8.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0 0.0 6.0 4.0 2.0 24.0 2.0	\$0.00 \$0.00 \$1,050.00 \$700.00 \$350.00 \$3,980.00 \$370.00		\$0.00 \$0.00 \$1,050.00 \$700.00 \$350.00 \$3,980.00 \$370.00
	I. Complete the Project Quality Checklist II Update the report to include the ICM model comparison and updated HMS model III. Develop the report Chapter for the hydraulta analysis that includes inundation mapping as appropriate	1 12.0 2 4	2 1 8.0 4	0.0	0.0	4.0	0.0	0.0	0.0	0.0 0.0 6.0 4.0 2.0 24.0 2.0 0.0 0.0 12.0	\$0.00 \$0.00 \$1,050.00 \$350.00 \$350.00 \$3,980.00 \$370.00 \$370.00 \$0.00 \$1,840.00		\$0.00 \$0.00 \$1,050.00 \$350.00 \$350.00 \$3,980.00 \$370.00 \$0.00 \$1,840.00
<u> </u>	Complete the Project Quality Chucklist Update the project Quality Chucklist Update the project to builde the CKU model comparison and updated MMS model Update the project chapter for the hydrawite analysis that includes inundation mapping as appropriate var Tabilated depth of Model (SKL), and velocity a key locations C Complete GII information and populate the Results Geodatabase C Complete GII information and populate the Results Geodatabase	1 12.0 2 4	2 1 8.0 4	0.0	0.0	<b>4.0</b>	0.0	0.0	0.0	0.0 0.0 6.0 4.0 2.0 2.0 2.0 0.0 12.0 0.0 0.0 0.0 0.0 0.0	\$0.00 \$0.00 \$1,050.00 \$350.00 \$350.00 \$3398.00 \$370.00 \$1,840.00 \$1,840.00 \$0.00 \$1,840.00 \$1,98		\$0.00 \$0.00 \$1,050.00 \$350.00 \$3,980.00 \$3,70.00 \$3,70.00 \$3,70.00 \$1,840.00 \$0.00 \$0.00 \$2,000 \$2,000 \$2,000 \$2,000
	Econjulate the Project Duality Checklist     Econjulate the Project Duality Checklist     Econjulate the Project Duality for Mindel comparison and updated HMS model     Econjulate the Project Chapter for the hydraulic analysis that includes invadidism mapping as appropriate     in. Develop the Project Chapter for Defending WSEL and Vectority at key for closed     v. Compile GS information and populate the Neuritis Cerestations     v. Compile GS information and populate the Neuritis Cerestations     v. Compile GS information and populate the Neuritis Cerestations     v. Compile GS information and populate the Neuritis Cerestations     v. Compile GS information and populate the Neuritis Cerestations     v. Saming EGT or explorations     discussion of the Project Cerestations     visual compiler and hydraulic models for review     visual compiler to the Neuritis Cerestations	1 12.0 2 4 2 2 2 4	2 1 8.0 4 4	0.0	0.0	4.0	0.0	0.0	0.0	0.0 0.0 6.0 2.0 2.0 0.0 12.0 0.0 12.0 0.0 2.0 0.0 2.0 0.0 8.0	\$0.00 \$0.00 \$1,050.00 \$370.00 \$3370.00 \$3370.00 \$3370.00 \$0.00 \$3,800 \$0.00 \$3,800 \$0.00 \$3,800 \$0.00 \$3,000 \$0.00 \$3,0000 \$3,0000000 \$3,00000 \$3,00000 \$3,00000 \$3,000000 \$3,00000 \$3,000000000		50.00 \$0.00 \$1,050.00 \$700.00 \$350.00 \$3,980.00 \$3,980.00 \$1,840.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$370.00 \$0.00 \$0.00 \$1,840.00 \$0,00 \$0.00 \$0,000 \$0,0000 \$0,00
Task 5: Field As 1. Deskto	Complete the Project Quality Checklist     Jupdate the regord to hardly Checklist     Jupdate the regord to hardle for the hydraulic analysis that includes inundation mapping as appropriate     A complete Disording WSL and weeking at any occurs     Something of regord regimes and the result of the hydraulic analysis     Something of regord regimes and the results (Secondatabase     M. Samething of regord regimes)     Something of regimes and the regimes and the results     Something of regimes and the regimes and the regimes     M. Respond to Poly Receive     Anderson of the Poly Receive     Anderson     Poly Received to Poly Receive	1 12.0 2 4 2 4 4 4 2 4.0	2 1 8.0 4 4 4 4.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0 0.0 6.0 2.0 24.0 2.0 0.0 0.0 2.0 0.0 0.0 2.0 0.0 8.0 8.0	\$3.00 \$0.00 \$1.050.00 \$3.00 \$3.00 \$3.00 \$3.00 \$3.00 \$1.840.00 \$0.00 \$3.00 \$1.400.00 \$1.400.00 \$1.400.00		50.00 50.00 5700.00 5700.00 5330.00 533.980.00 53370.00 53.00 50.00 50.00 53.00 50.00 53.00 50.00 53.00 50
Task 5: Field As 1. Deskto 2. Field Re	Complete the Project Duality Checklist     Lipulate the regrout chulder for Mindel comparison and updated HMS model     Lipulate the regrout chulder for the hydraulic analysis that includes inundation mapping as appropriate     w. Tabulated depth of Hooding WSL1, and velocity at lay docators     v. Compile GS information and populate the Result Scedatabase     vi. Somet point or regrout or regioner and     will somethin thydrologic and hydraulic models for review     vii. Submit point or region review     vii. Submit point or region review     vii. Submit point or regioner and     vii. Subm	1 12.0 2 4 2 4 4 2 2 2 2 2 8.0	2 1 8.0 4 4 4.0 2 2 0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0 0.0 0.0 4.0 2.0 24.0 2.0 24.0 0.0 0.0 12.0 0.0 0.0 0.0 0.0 0.0 8.0 8.0 4.0 4.0 28.0	\$0.00 \$0.00 \$1,050.00 \$3,980.00 \$3,980.00 \$3,980.00 \$3,70.00 \$3,70.00 \$1,440.00 \$1,440.00 \$1,440.00 \$1,440.00 \$3,70.00 \$1,440.00\$1,440.0		50.00 51.050 51.050.00 5700.00 5330.00 5330.00 5330.00 53.00 50.00 53.00 50.00 53.
Task 5: Field As 1. Deskto 2. Field Re	Complete the Project Duality Checklist     Lipudate the regrout chudge for Mondel comparison and updated HMS model     Lipudate the regrout chudge for Othe hydraulic analysis that includes inundation mupping as appropriate     with a Tabulated depth of Hooding WSL1 and Vectority at Lipudate charges and the footing WSL1 and Vectority at Lipudate charges and the Second Secon	1 1220 2 4 2 2 4 4 2 2 2 2 2 2 2 80 4 24	2 1 8.0 4 4 4 2 2 2 2 0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0 0.0 6.0 4.0 2.0 2.0 2.0 0.0 12.0 0.0 0.0 0.0 0.0 0.0 8.0 <b>8.0</b> <b>4.0</b> 4.0 2.2 0.0 2.0 0.0 0.0 0.0 0.0 0.0 0.0 0	50.00 50.00 51.00 53.00 53.00 53.00 53.00 53.00 53.00 50.00 50.00 51.840.00 50.00 51.400.00 51.4		\$0.00 \$1,450.00 \$1700.00 \$350.00 \$339.00 \$339.00 \$3,980.00 \$3,980.00 \$3,980.00 \$3,980.00 \$3,980.00 \$3,980.00 \$3,0000\$\$3,0000\$\$3,0000\$\$3,0000\$\$3,0000\$\$3,0000\$\$3,000\$\$3,000\$\$3,000\$\$3,000\$\$0,000\$\$3,000\$\$\$3,000\$\$\$3,0
Task 5: Field Aa 1. Deskto 2. Field Re 3. Interview	Complete the Project Duality Checklist     Lopolate the regrout chudde to Kin Model comparison and updated HMS model     Lopekee the report chudge for the hydraulic analysis that includes inundation mupping as appropriate     No. Tabulated depth of Hooding, WSL, and velocity at k to clocks     X. Complet Gist Information and populate the Results Geodatabase     V. Somet gist of registro for MgR register     Will Somet Micro For MgR register     Vis Somet gist of registromes and models for register     Will Somet Micro For MgR register     X. Complete Gistroments and models for register     Will Somet Micro For MgR register     X. Complete Gistroments and models     X. Complete Gistroments and models     X. Complete Gistroments and models     X. Complete For Complete Texture     X. Somet Gistroments and models     X. Complete Gistroments and models     X. Complete For Complete Texture     X. Somet Gistroments and models     X. Complete For Complete Texture     X. Somet Gistroments and models     X. Complete For Complete Texture     X. Somet Gistroments and models     X. Complete For Complete Texture     X. Somet Gistroment Calls Collected     X. Complete Field Channel assessment with CMT     X. Forder Somet Constant Microsoft Areas     X. Complete Field Channel Social Sorvices     X. Complete Field Channel Social Sorvices     X. Complete Field Channel Social Soc	1 1220 2 4 4 4 2 2 2 28.0 4 2 28.0 4 24 24 6.0 6.0	2 1 80 4 4 2 2 2 00 00	0.0	0.0	4.0	0.0	0.0	0.0	0.0 0.0 6.0 4.0 2.0 0.0 12.0 0.0 2.0 0.0 2.0 0.0 2.0 0.0 8.0 8.0 4.0 4.0 4.0 4.0 4.0 0.0 0.0 0.0 0.0 0	2000 \$0.00 \$0.00 \$1,080.00 \$3.00		50.00 \$1,050.00 \$1,050.00 \$1,050.00 \$1,050.00 \$1,0000 \$1,000 \$1,0000 \$1,0000 \$1,0000 \$1,0000 \$1,0000 \$1,00
Task 5: Field As 1. Deskto 2. Field Re 3. Intensi	Complete the Project Duality Checklist     Lopolate the regrout Duality Checklist     Lopered by the report chapter for the hydraulic analysis that includes inudation mapping as appropriate     W. Tabulated depth of Hooding WSL and velocity at ky occurs     Somet point for a for the hydraulic analysis that includes inudation mapping as appropriate     W. Complet Gisting Checklist, and velocity at ky occurs     Somet point regrout for MyR relevant     Somet point regrout for MyR relevant     Somet point regrout for MyR relevant     Somet point regrouts and models for relevant     Somet point regrouts and models     Somet point regrouts point regrouts     Somet point regrouts point regrouts     Somet point regrouts point regrouts     Somet point regrouts     Sometpoint regrouts     Somet point regrouts     Somet point regrouts	1 12.0 2 4 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 8.0 4 4 4 2 2 2 0.0 0 0.0	0.0	0.0	4.0 4 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0	0.0 0.0 6.0 2.0 2.0 0.0 12.0 0.0 12.0 0.0 0.0 0.0 0.0 8.0 8.0 4.0 28.0 4.0 28.0 4.0 28.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	2000 5000 5100 5100 5100 5100 5100 5100 53100 5300 53100 5300 53100 5300 53100 5300 53100 5300 53100 5300 53100 5000 53100 5000 53100 5000 53100 5000 53100 5300 53100 5300 53100 5300 53100 5300 53100 5300 53100 5300 50		50.00 50.00 51.068.00 5330.00 5330.00 53.00 53.00 53.00 50.00 50.00 51.400.00 50.00 51.400.00 50.00 51.400.00 50.00 53.
Task 5: Field As 1. Deskto 2. Field Rr 3. Intensi	Complete the Project Duality Checklik     Loperter the Project Duality Checklik     Loperter the Project Duality Checklik     Loperter Dranger for Den Informatic analysis that includes inundation mapping as appropriate     W. Tabulatide depth of Hooding WSLs and vectority is that includes inundation mapping as appropriate     W. Complet Gisting Checklik     Softmit port of registreeme     Softmit port of registreement     Softmit por	1 120 2 4 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 4 2 2 2 0.0 0.0	0.0	0.0	4.0 4.1 4 4 0.0 0.0 0.0 0.0	00 00 00 00 00	0.0 0.0 0.0 0.0 0.0	0.0	0.0 0.0 6.0 2.0 2.0 0.0 2.0 0.0 0.0 0.0 0.0 0.0 0	2.0.00 5.0.00		53.00 50.00 50.000
Task 5: Field As 1. Deskto 2. Field Re 3. Intensit	Complete the Project Duality Checklist     Lipolatis the report chapter for the hydraulic analysis that incides innation mapping as appropriate     in: Develop the report chapter for the hydraulic analysis that incides innation mapping as appropriate     in: Develop the report chapter for fooding WSLs underklow have brockers     v. Complete GSI information and populate the Neurist Secolatabase     v. Some gSI of report of pilk review     will. Salowing ESI of the Market Secolatabase     vill. Salowing ESI of complexity that incides innations     accent and the physical complexity of the Secolatabase     vill. Salowing ESI of the Annel stability     E. Desktog analysis of the channel stability     E. Desktog analysis of the channel stability     E. Coefficient EGI channel assessment with CMT     E. Coefficient EGI channel assessment with CMT     E. Coefficient EGI channel assessment with CMT     E. Telefic channel assessment with CMT     E. Orderstaber EGI channel asses	1 12.0 2 4 4 2 2 2 2 4 2 2 2 2 2 2 2 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 4 2 2 2 2 0.0	0.0	0.0	4.0 4 4 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0	0.0	0.0 0.0 0.0 4.0 2.0 2.0 0.0 12.0 0.0 2.0 0.0 0.0 2.0 0.0 0.0 2.0 0.0 0	5000 5000 5000 5000 5000 5000 5000 500		\$3.00 \$1.00000 \$1.000000 \$1.000000 \$1.000000 \$1.000000000 \$1.0000000000
Task 5: Field As 1. Desktop 2. Field Ri 3. Intensit 4. QA Me	Complete the Project Duality Checklist     Lipolate the Project Duality Checklist Duality Checklist     Lipolate the Channel Induality	1 1220 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 4 2 2 2 0.0 0.0 0.0	0.0	0.0	4.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0	00 00 00 00 00 00 00	0.0	0.0 0.0 0.0 4.0 2.0 2.0 0.0 2.0 0.0 2.0 0.0 0.0 0.0 0	5000 5000 5000 5000 5000 51,0500 51,0500 53100 53100 53100 53100 53100 53100 53100 53100 53100 53100 53100 53100 53100 53100 53100 53100 53100 5310 531		53.00 53.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 54.00 55.00 54.00 55.00 54.00 55.00
Task 5: Field Ac 1. Deskto 2. Field Rc 3. Intensit 4. QA Me 5. Delivat	Comparise the Project Duality Checklist     Lipolate Duality Checklist     Lipolate the Project Duality Checklist     Lipolate Duality Checklist     Lipolat	1 120 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 4 4 2 2 0.0 0.0 2.0 2.0 2.0 2.0 8.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0	4.0 4.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00	0.0	0.0 0.0 6.0 4.0 2.0 2.0 2.0 0.0 0.0 0.0 0.0 0	5000 5000 51000 53000 53000 53000 53000 531000 531000 511000 511000 511000 511000 511000 511000 511000 511000 511000 511000 51000 51000 51000 510000 510000 510000 510000 510000 510000 510000 510000 510000 510000 510000 510000 5100000 5100000 5100000 5100000 5100000 5100000 5100000 51000000 51000000 510000000 51000000 5100000000		5 30.00 5 30.00 5 30.00 5 30.00 5 31.900,00 5 31.900,00 5 31.900,00 5 31.900,00 5 31.900,00 5 30.00 5
Task 5: Field Ac 1. Deskto 2. Field Rd 3. Intensi 4. QA Me 5. Deliver	Comparison the Project Duality Checklist     Lipolatist the regord to Duality Checklist     Lipolatist the regord to Duality of the Model comparison and updated MMS model     Lipolatist the regord to Duality of the Model Comparison and updated MMS model     Lipolatist the regord to Duality of the Model Comparison and updated MMS model     Lipolatist the regord to Polatist of the Model Comparison and updated MMS model     Lipolatist the regord to Duality of Model MMS model     Some Total Comparison and updated the Neurol Science Sci	1 120 2 7 4 4 7 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 4 2 2 0.0 0.0 0.0 2 2 2 2 6.0 2 2 2 2 2 2 2	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	4.0 4.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 60 20 20 20 00 00 00 00 00 00 00 00 00 00	50 00 50 00 51,050,00 53,000 53,000 53,000 53,000 53,000 53,000 53,000 53,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,000 50,000 54,00		5 30.00 5 30.00 5 31.0000 5 31.0000 5 31.0000 5 31.9000 5 31.9000 5 31.9000 5 31.9000 5 31.90
Task 5: Field Ac	Complete the Project Quality Checklist     Lipolate the report Output for Min	1 120 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 8.0 4 4 4 2 2 0.0 0.0 0.0 2 2 2 2 2 2 2 2 2 2 2 2 2	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	4.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	000 000 60 200 200 200 200 200 2	5000 5000 51000 53000 53000 53000 531000 531000 531000 531000 531000 531000 531000 531000 531000 531000 531000 531000 531000 531000 531000 53000 531000 53000 531000 53000 531000 53000 531000 53000 531000 53000 531000 53000 53000 53000 53000 53000 5300000 5300000 5300000 5300000 5300000 5300000 5300000000		5 30.00 5 10.000 5 10
Task 5: Field At 1. Deskto 2. Field Re 3. Intensit 4. QA Me 5. Deliver	Complete the Project Duality Checklist     Lipolate the report Duality Checklist     Lipolate the report Duality for the hydraulic analysis that includes inundation mapping as appropriate     A Tabulated depth of fooding WSL and velocity at key docutors     A Complete Gis Information and populate the Result Scedatabase     A Samit piol of report for hydraulic analysis that includes inundation mapping as appropriate     Submit piol for report for hydraulic analysis (Scedatabase     A Samit piol of report for hydraulic analysis (Scedatabase     A Samit piol of report for hydraulic analysis (Scedatabase     A Samit piol for report for hydraulic analysis     Samit Hydrologic and hydraulic models for review     All Resport for hydraulic analysis     Samit Samit Frank (Scedatabase     A Samit piol for report for hydraulic analysis     Samit Interview (Scedatabase     All Analysis     A create a map of revision and mittabality locations     A process and exploration massessment     All Analysis     Advase     All Analysis	1 120 2 2 - - - - - - - - - - - - -	2 1 80 4 4 4 2 2 0.0 0.0 0.0 0.0 0.0 0.0 0.	0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	4.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00	0.0	00 00 60 20 240 240 240 240 240 240 240	50 00 50 00 51,050,00 51,050,00 53,000 53		5 30.00 51.00 200 51.00 200 51.90 200 50.00 200 50
Task 5: Field As 1. Deskto 2. Field Re 3. Intensit 4. QA Me 5. Deliver 7ask 6: Identify 1. Identify 1. Identify	Conjette the Project Duilty Checklist     Logidate the regort Duilty Checklist     Logidate the regort chapter for the hydraulic analysis that includes inundation mapping as appropriate     A complete Gis Information and populate the Result Scedatabase     A complete Gis Information and populate the Result Scedatabase     A complete Gis Information and populate the Result Scedatabase     A complete Gis Information and populate the Result Scedatabase     A complete Gis Information and populate the Result Scedatabase     A complete Gis Information and monthly models based on comments     Bernet Hydroligue and hydraulic analysis     Result of Complete Status and Complete Complete Complete Complete     A complete Gis Information and monthly models based     A complete of Complete Status and Complete Complete Complete     A complete of Complete Complete Complete Complete Complete Complete Complete Complete     A complete of Complete C	1 120 22 3 4 - 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0	00         00           60         00           60         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           210         00           210         00	5000 5000 5000 5100 5100 5100 5100 5100		53.00 51.00 50.00 51.00 51.00 50.00
Task S: Field Ac Deskto	Consistence the Project Quality Checklist     Lipolate the regord Charles (Checklist     Lipolate the Checklist     Lipolate the Project Charles (Checklist     Lipolate the Project Charles (Checklist     Lipolate the Project Charles (Checklist     Lipolate the Project Checklist     Lipolate the Checklist     Lipolate the Project Checklist     Lipolate the Project Checklist     Lipolate the Project Checklist     Lipolate the Checklist     Lipolate the Project Che	1 120 2 2 3 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 4 2 2 3 4 4 2 2 3 4 4 4 4 4 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00 00 00	00         00           60         00           60         00           20         00           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           40         240           20         20           20         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           10         10           10         10           110         00           00         00	5000 500 500 500 500 510 500 50		53.00 51.00 50
Task S: Field Ac L Deskto L De	Consistence the Project Quality Checklist     Lipdate the regord to indice the KM model comparison and updated HMS model     Lipdate the regord to indice the KM model comparison and updated HMS model     Lipdate the regord to indice the KM model comparison and updated HMS model     Lipdate the regord to fooding WSL and velocity at ky docutors     Complet Gis Information and populate the Result Scottality and the controls     Complet Gis Information and populate the Result Scottality and the controls     Something of regord to regis     Something of regord regis     Something of regord regis     Something of regord regis     Something of regord regis     Something of registration     Something of registratin     Something of registration     Something of registration	1 120 2 2 4 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 4 2 2 3 4 4 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	4.0 4.0 4.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00         00           60         00           60         00           20         00           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           40         40           240         20           20         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           100         00           110         00           00         00           00         00           00         00           00         00           00         00           00         00           00	5000 5000 510000 510000 510000 510000 510000 510000 510000 5100000 510000 510000 510000 510000 500000 500000 5000000		53.00 54.00 54.00 55.000
Task S: Field Ac L Deskto L De	Consistence the Project Duality Checklist     Lipdate the regord Toulity for NetWeild     Lipdate the regord toulity for NetWeild     Lipdate the regord to head to the Model comparison and updated HMS model     Lipdate the regord to head to the Model comparison and updated HMS model     Lipdate the regord to head to the Model comparison and updated HMS model     Lipdate the regord to head to the Model comparison and updated HMS model     Lipdate the regord to head to the Model comparison and updated HMS model     Lipdate the regord to head to the Model controls     Complet Gist Information and populate the Result Scottables     Vi. Somit point or regord region     Komparison and update date of comments     Somitation of regord region     Komparison and update date of comments     Somitation assessment with OHT     Lipdate field during dates and update dates and norphology     Lipdate Field during dates and update dates and norphology     Lipdate Field during dates and update dates and norphology     Lipdate Field during dates and update dates     Field intervisions field during dates and norphology     Lipdate Field during dates and update dates     Field intervisions field during the channel subsetment     Locontinue tources and erolded ansis     Field intervisions field during the channel subsetment     Locontext provided during the channel subset data     Locontext provided during the channel subsetment     Locontext provided durin	1 120 2 2 4 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 4 2 2 3 4 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	4.0 4.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00         00           60         00           60         00           20         00           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           20         20           40         20           20         20           20         20           20         20           20         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         <	5000 5000 51000 50000 51000 51000 50000 510000 510000 510000 510000 510000 510000 510000 5100000 510000 510000 5000000		51,000 50,000 50,0000 50,0000 50,0000 50,0000 50,0000 50,0000 50,0000 50,00000 50,0000
Task 5: Field Ac L Deskto L De	Complete the Project Duilty Checklist     Lipdate The Project Duilty Chec	1 120 120 2 	2 1 80 4 4 - - - - - - - - - - - - -	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	40 40 40 40 40 40 40 40 40 40	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00         00           60         00           60         00           60         00           20         00           20         20           20         20           20         20           20         20           20         20           20         00           20         00           20         00           20         00           20         00           20         00           20         00           20         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         <	25000 2500 2500 2500 2500 2500 2500 250		53.00 54.00 54.00 55.00
Task 5: Field Ac Task 5: Field Ac Deskto D	Compete the Project Duilsty Checklist     Lipdate the regret Duilsty Checklisty     Lipda	1 120 2 2 3 4 4 3 2 2 2 2 2 2 2 2 2 2 3 0 0 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 80 4 4 - - - - - - - - - - - - -	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	40 40 4 00 00 00 00 00 00 00 00 00 00 00	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00         00           60         00           60         00           60         00           20         <	50.00 50.00		53.00 54.00 54.00 54.00 55.000
Task 5: Field Ac 1: Deskto 2: Field Re 3: Intensit 4: QA Me 5: Deliver 1: Control Control Control 1: Identifi 2: Qualita 3: Scoring 4: QA Me 5: Deliver 1: Control 1:	Consistence the Project Duality Deckline     Lopekter the Project Project Deckline     Lopekter the Projekter Deckline     Lopekter the Project Deckline     Lopekter the	1 120 120 2 - - - - - - - - - - - - -	2 1 80 4 4 - - - - - - - - - - - - -	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00 00 00 00 00 00 00 00 00 00 00 00 00	40 40 40 40 40 40 40 40 40 40	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	00         00           60         00           60         00           20         00           20         120           120         120           120         120           120         120           120         120           120         120           120         120           120         120           20         00           20         00           20         00           00	50.00 50.00		53.00 54.00 54.00 55.00

	Bones Creek									1			
Item Number	Description	Senior Project		Senior Engineer	HDR					_	Combir	ned Totals (CT)	
Task 1: Project #	-tan seemant	Manager \$280.00	Technical Expert \$250.00	Lead Modeler \$185.00	Engineer \$155.00	EI \$125.00	Accountant \$125.00	Admin \$85.00	Other \$75.00	Hours	Labor	Expense	Total
1. Project I	la Project schedule management	28.0 8	0.0	0.0	0.0	0.0	24.0	8.0	0.0	60.0 8.0	\$11,520.00 \$2,240.00		\$11,520.00 \$2,240.00
2. Meetine	ii. Monthly reporting updates including out-of-scope work iii. coordination with FNI \$	12 8 31.0	2.0	15.0	0.0	0.0	24	8	0.0	44.0 8.0 48.0	\$7,040.00 \$2,240.00 \$11,955.00		\$7,040.00 \$2,240.00 \$11,955.00
2. meeting	i. Conduct monthly progress meetings ii. Include quality review as milestones listed below	15	2.0	9	0.0	0.0	0.0	0.0	0.0	24.0	\$5,865.00		\$5,865.00
	a. kickoff and data collection meeting b. Discuss concern areas and draft project concepts	2	2	2 4						6.0 6.0	\$1,430.00 \$1,300.00		\$1,430.00 \$1,300.00
Task 2: Data Col	2. Weekly phone calls lection and Field Survey lection	12	0.0	9.0	16.0	4.0	0.0	0.0	0.0	33.0	\$3,360.00		\$3,360.00
	i. Review GIS information provided by City ii. Obtain and review previous study, reports, and as-built data	1		4 2	2 4					7.0	\$1,330.00 \$1,270.00		\$1,330.00
	iii. Review program data and FEMA models. Request Preliminary FEMA models     iv. Review & update Quality Checklist     update duality Checklist	1		1 2	2					4.0	\$775.00 \$1,270.00		\$775.00 \$1,270.00
	v. Opload into to City s snarevoint site vi. Conduct site visits to document limits and initial conditions vii. Prepare base map of existing conditions				4	4				0.0	\$0.00 \$0.00 \$1.120.00		\$0.00 \$0.00 \$1.120.00
2. Field Sur	vey I: Review Field Survey Information	<b>2.0</b> 2	0.0	4.0 4	12.0 12	0.0	0.0	0.0	0.0	18.0 18.0	\$3,160.00 \$3,160.00	0	\$3,160.00 \$3,160.00
3. Modera	te and high-hazard road crossing condition assessment I. Moderate and high-hazard road crossing condition assessment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00 \$0.00	0	\$0.00 \$0.00
Task 3: Detailed 1. Hydrolog	Hydrologic Analysis gic Model Updates	11.0	12.0	92.0	132.0	176.0	0.0	0.0	0.0	423.0	\$65,560.00		\$65,560.00
	Revise the existing subbasins boundaries where necessary based on survey data     Jii. Split up subbasins for ICM catchments     Defense in the substance of the substance	2	4	6 16	40	40				8.0 102.0	\$1,670.00		\$1,670.00
	III. Define model input parameters iv. Input catchments into ICM model and perfrom internal QC v Summarize similicant changes in the HMS subhasin parameters	2	4	32 24 4	60 16	80 32 8				1/8.0 78.0 13.0	\$26,780.00 \$12,480.00 \$2,020.00		\$26,780.00 \$12,480.00 \$2,020.00
	vi. Modify existing HMS model subbasisns parameters where significant changes occur. vii. Modify existing HMS model routing parameters after ICM model is complete	1		8	12 4	12				33.0 11.0	\$5,120.00 \$1,770.00		\$5,120.00 \$1,770.00
2. QA Mee	ting i. QA Meeting J. Quality Checklist to Beld	3.0	0.0	6.0 4	0.0	0.0	0.0	0.0	0.0	9.0 6.0	\$1,950.00 \$1,300.00		\$1,950.00 \$1,300.00
3. Delivera	bes i. Develop the chapter(s) of the report summarizing the hydrologic analysis and methodolgy	7.0 2	1.0	22.0 8	40.0 24	26.0 8	0.0	0.0	0.0	96.0 42.0	\$15,730.00 \$6,760.00		\$15,730.00 \$6,760.00
	II. Complete the Project Quality Checklist III. Complete SIS support Information Schelle Breact Checklist (Lindowskie)	1		2	6	2				11.0 8.0	\$1,830.00		\$1,830.00 \$1,180.00
Task 4: Detailed	IV. sourmix kepport, checklist, usi information, ICM model, and HEC-HMS model for review v. Incorporate CMT comments into model, respond to comments on checklist, update the report accordingly Hydraulic Analysis	2	1	6	8	12				6.0 29.0	\$1,300.00 \$4,660.00		\$1,300.00 \$4,660.00
1. HEC-RAS	Steady State Hydraulic Modeling <ol> <li>Develop new HEC-RAS Steady hydraulic model or augment the latest FEMA model if applicable</li> </ol>	18.0 8	0.0	62.0 32	128.0 80	156.0 100	0.0	0.0	0.0	364.0 220.0	\$55,850.00 \$33,060.00		\$55,850.00 \$33,060.00
	Update channel and pond routings in hydrologic model     Undermine the water surface elevations for the streams for existing storm events     Undermine the inventione content for available attemption	2		4	8	16 8				29.0 22.0	\$4,260.00 \$3,540.00		\$4,260.00 \$3,540.00 \$1,770.00
	w. Develop the multipation extents for existing storm revents w. Perform model validation using results from two historic rainfall hyetographs (discuss results with Core Team) w. Identify concern locations and flood prone areas	2		8	4 12 16	4 12 16				34.0	\$5,400.00		\$5,400.00 \$6,150.00
2. HEC-RAS	vii. Identify areas within the studied reach that will require additional 2D or Unsteady State modeling Unsteady and 2D Hydraulic Modeling	2 0.0	0.0	6 0.0	0.0	0.0	0.0	0.0	0.0	8.0 0.0	\$1,670.00 <b>\$0.00</b>		\$1,670.00 \$0.00
	<ol> <li>Develop new HEC-RAS Unsteady/2D model for study area or augment the latest FEMA model if applicable ii. Develop boundary conditions diagram for study area iii. Determine the water surface elevations for the existing conditions</li> </ol>									0.0	\$0.00 \$0.00 \$0.00		\$0.00 \$0.00 \$0.00
	iv. Develop the 100-year inundation extents for existing storm events v. Identify concern locations and flood prone areas									0.0	\$0.00 \$0.00		\$0.00
3. Seconda	ry System 1D Modeling 1. Field verify inlets, outlet pipes for the entire system II. Danken a cuttem conclife modeline anomath and emaile instification	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00		\$0.00
	II. Develop a system-specific modeling approach and provide justification III. Add links and nodes to represent overland flow, document source Iv. Develop flow loading diagram for system									0.0	\$0.00		\$0.00
	v. Determine the water surface elevations where flow is not contained by the storm drain system for existing storm events									0.0	\$0.00		\$0.00
4. Seconda	vi. Develop the inundation extents within the system study limits for existing storm events vii. Identify concern locations and flood prone areas cv. System 2D Modeline	47.0	26.0	164.0	384.0	312.0	0.0	0.0	0.0	0.0 0.0 933.0	\$0.00 \$0.00 \$148.520.00		\$0.00 \$0.00 \$148,520.00
4. Seconda	Develop a system specific modeling appraoch and submit to PgM     Everify inlets	6	200	22	24	4	0.0	0.0	0.0	56.0	\$9,970.00		\$9,970.00
	iii. Develop the ICM model for each storm drainage system based on survey data, LIDAR data, and as-builts iv. Where the system is surcharged and the overflow path is known and multidirectional, add 2D Zones to represent the survey of the system.	16	8	48	120	80				272.0	\$43,960.00		\$43,960.00
	overano now. v. Develop flow loading diagram for system	16	8	6	180	180				444.0	\$3,130.00		\$67,980.00 \$3,130.00
	vi. Determine the water surface elevations where flow is not contained by the storm drain system for existing storm events vii. Develop the inundation extents for existing storm events	2	4	6	8 16	16 8				32.0 34.0	\$4,910.00 \$5,590.00		\$4,910.00 \$5,590.00
5 Hydrolog	viii. Perform model validation for two historic storm events and review results with the City ix. Identify concern locations and flood prone areas is Modeline Uncited	2	2 4	8	16 12 24.0	16 4 16.0	0.0	0.0	0.0	46.0 30.0	\$7,580.00 \$5,400.00		\$7,580.00 \$5,400.00 \$8,780.00
	Lo Determine existing discharges at HMS subbasin locations     Compare ICM peak flows to HMS values and generate comparison table for review	1	0.0	2	4 4	10.0	0.0	0.0	0.0	7.0	\$1,270.00		\$1,270.00
6. QA Mee	iii, Update the existing HEC-HMS model to better reflect the ICM model results ting Loo Marchae	2 6.0	0.0	8 12.0	16 0.0	16 0.0	0.0	0.0	0.0	42.0	\$6,520.00 \$3,900.00		\$6,520.00 \$3,900.00
7. Delivera	i. UX Weeding ii. Quality Checklist to PgM bles	4 2 14.0	4.0	4 39.0	80.0	72.0	0.0	4.0	0.0	6.0 213.0	\$1,300.00 \$33,875.00		\$1,300.00 \$33,875.00
	<ol> <li>Complete the Project Quality Checklist</li> <li>Update the report to include the ICM model comparison and updated HMS model</li> </ol>	2		4 4	8					14.0 13.0	\$2,540.00 \$2,260.00		\$2,540.00 \$2,260.00
	iiii. Develop the report chapter for the hydraulic analysis that includes inundation mapping as appropriate     iv. Tabulated depth of flooding. WSEL, and velocity at key locations     v. Combile GC Information and nonulate the Results Geodatabase	4		16 2 2	32	32 8		4		88.0 10.0	\$13,380.00 \$1,370.00 \$1,990.00		\$13,380.00 \$1,370.00 \$1,990.00
	vi. Submit pdf of report for PgM review vii. Submit hydrologic and hydraulic models for review	2		2	4					4.0	\$930.00 \$1,085.00		\$930.00 \$1,085.00
Task 5: Field Ass	viii.Respond to PgM comments and modify models based on comments essment essment	4	4	8	24	24				64.0	\$10,320.00		\$10,320.00
1. Desktop	L. Desktop analysis of the channel stability ii. Review of condition assessment data collected	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00 \$0.00		\$0.00 \$0.00 \$0.00
2. Field Re	i. Coordinate field channel assessment with CMT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00		\$0.00
	In. reno: woserwatuma, waik channes and document restures and morphology III. Locate bank failures IV. Document sediment sources and eroded areas									0.0	\$0.00 \$0.00 \$0.00		\$0.00 \$0.00 \$0.00
3. Intensiv	Field Investigation (Special Services) <ol> <li>Field Review: Process field data collected during the stream assessment</li> </ol>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 \$0.00		\$0.00 \$0.00
	a. create a map of erosion and instability locations b. process and evaluate geologic data c. characterize the changed monthology and the changed evolution of study area.									0.0	\$0.00 \$0.00		\$0.00 \$0.00
	ii. Identify erosion near infrastructure iii. BEHI methods			<u> </u>						0.0	\$0.00		\$0.00
	iv. Channel dimension measurement y. Wolman pebble count									0.0	\$0.00		\$0.00
4. QA Mee	i. QA Meeting ii. Quality Checklist to PgM	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0 2.0 0.0	\$560.00 \$560.00 \$0.00		\$560.00 \$560.00 \$0.00
5. Delivera	ibles i. Quality Checklist	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 \$0.00		\$0.00 \$0.00
	III. Deliverables as outline in CMSM III. Memo summarizing methodology & results IV. Field data. Johots & desktoo calculations									0.0	\$0.00		\$0.00 \$0.00
	v. GIS information turned into City vi. Respond to one (1) round of PgM comments									0.0	\$0.00		\$0.00
Task 6: Identify 1. Identify	Concern Areas Concern Areas and the Need for Flood Risk Reduction Lidentify and Document Concern Areas	4.0	0.0	12.0	12.0	0.0	0.0	0.0	0.0	28.0	\$5,200.00		\$5,200.00
2. Qualitat	r, werning and bocument Loncern Areas jii, Populate tables Ve& Analysis	2 4.0	0.0	8 4 8.0	8 4 24.0	0.0	0.0	0.0	0.0	18.0 10.0 36.0	\$3,280.00 \$1,920.00 \$6,320.00		\$3,280.00 \$1,920.00 \$6,320.00
3. Scoring,	I. Complete Qualitative Analysis Categorizing, Identifying need for solution	4 4.0	0.0	8 16.0	24 24.0	32.0	0.0	0.0	0.0	36.0 76.0	\$6,320.00 \$11,800.00		\$6,320.00 \$11,800.00
4. QA Mee	IL-Loncern Areas will be scored, weighted and categorized ting I.O A Meeting	4 6.0 4	0.0	16 12.0 8	24 0.0	32 0.0	0.0	0.0	0.0	76.0 18.0 12.0	\$11,800.00 \$3,900.00 \$2,600.00		\$11,800.00 \$3,900.00 \$2,600.00
5. Delivera	II. Quality Checklist to PgM bles	2 10.0	2.0	4 20.0	34.0	34.0	0.0	0.0	0.0	6.0 100.0	\$1,300.00		\$1,300.00
	I. Quality Checklist ii. Report section, GIS information, tables & exhibits III: Concerne Acad Methode is Excel format	2.0	2	4.0	12	16 8				36.0	\$5,660.00		\$5,660.00 \$4,160.00
<u> </u>	III. Current Area WOLKBOOK IN EXCELTORMAL IV. Submit draft of report to CMT for review V. Incorporate CMT comments in the final report	2 2 2		4	8	8				14.0 18.0 6.0	\$2,600.00 \$2,800.00 \$1,300.00		\$2,600.00 \$2,800.00 \$1,300.00
<b>—</b>	Total	204.0	47.0	505.0	910.0	828.0	24.0	12.0	0.0	2530	\$410.865.00		\$410.865.00

	Bones Creek											
Item Number	Description	Project Director \$250.00	Project Manager \$180.00	Technical Expert / Lead Modeler \$240.00	Woolper Modeler \$160.00	rt Engineer \$155.00	EIT/GIS \$125.00	Field Tech \$115.00	Admin \$106.00	Hours	Combin	ed Totals (CT) Expense Total
Task 1: Project N 1. Project N	Aanagement Aanagement	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00	\$0.00
2. Meeting	L Project schedule management III. Monthly reporting updates including out-of-scope work III. coordination with TNI S I Conduct monthly anaress meetings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0 0.0 0.0 0.0	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00
	ii. Include quality revew as milistones listed below a. kikalif and data collection meeting b. Discuss concern areas and draft project concepts b. Discuss concern areas and draft project concepts									0.0 0.0 0.0 0.0	\$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00
Task 2: Data Col	2. Weekly phone calls ection and Field Survey									0.0	\$0.00	\$0.00
1. Data Col	lection I. Beview GIS information provided by City II. Obtain and review previous study, reports, and as-built data III. Beview vorem data and FEMA models. Resuest Preliminary FEMA models III. Beview vorem data and FEMA models.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0 0.0	\$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00
	iv. Review & update Quality Checklist v. Upload info to City's SharePoint site									0.0	\$0.00 \$0.00	\$0.00
	vi. Conduct site visits to document limits and initial conditions vii. Prepare base map of existing conditions									0.0	\$0.00 \$0.00	\$0.00
2. Field Sur	vey i. Review Field Survey Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 \$0.00	0 \$0.00 \$0.00
3. Moderat	e and high-hazard road crossing condition assessment i. Moderate and high-hazard road crossing condition assessment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 \$0.00	0 <b>\$0.00</b> \$0.00
Task 3: Detailed	Hydrologic Analysis									0.0	\$0.00	\$0.00
1. Hydrolog	ic wooder uppartes i. Revise the existing subbasins boundaries where necessary based on survey data ii. Selfu on subbasient for ICM eachments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00	\$0.00
	"In gene powedarian's network statistics of the second statistics									0.0 0.0 0.0 0.0 0.0 0.0	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00
2. QA Meet	ing I: QA Meeting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00	\$0.00 \$0.00
3. Delivera	ii. Quality Checklist to PgM bles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 <b>\$0.00</b>	\$0.00 \$0.00
	i. Develop the chapter(s) of the report summarizing the hydrologic analysis and methodolgy ii. Complete the Project Quality Checklist									0.0	\$0.00 \$0.00	\$0.00
	iii. Compile GIS support information iv. Submit Report, Checklist, GIS information, ICM model, and HEC-HMS model for review									0.0	\$0.00 \$0.00	\$0.00
Task 4: Detailed	v. Incorporate LMT comments into model, respond to comments on checklist, update the report accordingly  Hydraulic Analysis  Cond Class Hour II: Model Fere									0.0	\$0.00	\$0.00
1. HEC-RAS	Steady State Hydraulic Modeling i. Develop new HEC-RAS Steady hydraulic model or augment the latest FEMA model if applicable	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00	\$0.00 \$0.00
	iii. Operate chamine and point roturings in hyperbolic model iii. Determine the water surface elevations for the streams for existing storm events iv. Develon the inundation extents for existing storm events									0.0	\$0.00	\$0.00 \$0.00 \$0.00
	v. Perform model validation using results from two historic rainfall hyetographs (discuss results with Core Team) vi. Identify concern locations and flood prone areas									0.0	\$0.00 \$0.00	\$0.00
2. HEC-RAS	vii. Identify areas within the studied reach that will require additional 2D or Unsteady State modeling Unsteady and 2D Hydraulic Modeling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00	\$0.00
	i. Develop new HEC-RAS Unsteady/2D model for study area or augment the latest FEMA model if applicable ii. Develop boundary conditions diagram for study area									0.0	\$0.00 \$0.00	\$0.00
	iii. Determine the water surface elevations for the existing conditions iv. Develop the 100-year inundation extents for existing storm events									0.0	\$0.00 \$0.00	\$0.00 \$0.00
3. Seconda	v. Identify concern locations and flood prone areas ry System 1D Modeling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 <b>\$0.00</b>	\$0.00 \$0.00
	i. Field verify inlets, outlet pipes for the entire system ii. Develop a system-specific modeling approach and provide justification									0.0	\$0.00 \$0.00	\$0.00
	iii. Add links and nodes to represent overland flow, document source iv. Develop flow loading diagram for system									0.0	\$0.00 \$0.00	\$0.00 \$0.00
	v. Determine the water surface elevations where flow is not contained by the storm drain system for existing storm events									0.0	\$0.00	\$0.00
4. Seconda	vii. Identify concern locations and flood prone areas vii. Identify concern locations and flood prone areas vi System 20 Modeline	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00	\$0.00 \$0.00 \$0.00
	i. Develop a system specific modeling appraoch and submit to PgM ii. Verify inlets									0.0	\$0.00 \$0.00	\$0.00
	iii. Develop the ICM model for each storm drainage system based on survey data, LIDAR data, and as-builts iv. Where the system is surcharged and the overflow path is known and multidirectional, add 2D Zones to represent the overland									0.0	\$0.00	\$0.00
	flow. v. Develop flow loading diagram for system									0.0	\$0.00 \$0.00	\$0.00 \$0.00
	vi. Determine the water surface elevations where flow is not contained by the storm drain system for existing storm events									0.0	\$0.00	\$0.00
	viii. Develop the minimation extents for easing storm events viii. Perform model validation for two historic storm events and review results with the City is relatify concerne locations and flood runo areas									0.0	\$0.00	\$0.00
5 Hydrolog	is Normal concern outsions and noos profile areas is Modeling Updates i. Determine existing discharges at HMS subbasin locations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 \$0.00	\$0.00 \$0.00
	ii. Compare ICM peak flows to HMS values and generate comparison table for review iii, Update the existing HEC-HMS model to better reflect the ICM model results									0.0	\$0.00 \$0.00	\$0.00
6. QA Mee	ing i. QA Meeting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00	\$0.00 \$0.00
7. Delivera	ii. Quality Checklist to PgM bles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 \$0.00	\$0.00 \$0.00
	I. Complete the Project Quality Checksist ii Update the report to include the ICM model comparison and updated HMS model iii. Develop the aconst chaster for the hydraulic analysis that includes invudation manning as anoronizate.									0.0	\$0.00	\$0.00
	iv. Tabulated depth of flooding, WSEL, and velocity at key locations y Compile GS Information and nonulate the Results Gendatabase									0.0	\$0.00	\$0.00
	vi. Submit pdf of report for PgM review vii. Submit hydrologic and hydraulic models for review									0.0	\$0.00 \$0.00	\$0.00
Task 5: Field Ass	viii.Respond to PgM comments and modify models based on comments essment									0.0	\$0.00	\$0.00
1. Desktop	Analysis i. Desktop analysis of the channel stability	0.0	1.0	2.0	0.0	28.0 24	48.0 40	0.0	1.0	80.0 67.0	\$11,106.00 \$9,246.00	\$11,106.00 \$9,246.00
2. Field Red	ii. Review of condition assessment data collected connaissance Condition fold abare and the CM	0.0	1.0	1	0.0	4	8 80.0	80.0	1.0	13.0 167.0	\$1,860.00 \$20,346.00	\$1,860.00 \$20,346.00
	I: Coronate read chamine assessment with CWT     II: Field observations, walk channels and document features and morphology     II: Lorate hash failures		1	1		*	80	80	1	0.0	\$20,340.00	\$20,340.00
3. Intensive	iv. Document sediment sources and eroded areas Field Investigation (Special Services)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00	\$0.00 \$0.00
	<ol> <li>Field Review: Process field data collected during the stream assessment</li> <li>a. create a map of erosion and instability locations</li> </ol>									0.0	\$0.00 \$0.00	\$0.00
	b. process and evaluate geologic data c. characterize the channel morphology and the channel evolution of study area									0.0	\$0.00 \$0.00	\$0.00 \$0.00
	ii. Identify erosion near infrastructure iii. BEHI methods									0.0	\$0.00 \$0.00	\$0.00
4.04 Mar	IV. Channel dimension measurement V. Wolman pebble count Inc.			2.0		60				0.0	\$0.00	\$0.00
4. Qr mee	i. QA Meeting ii. Quality Cherklist to PoM	0.0	0.0	2	0.0	4	0.0	0.0	0.0	6.0	\$1,100.00	\$1,100.00
5. Delivera	bles i. Quality Checklist	0.0	2.0 1	3.0	0.0	36.0	24.0	12.0	1.0	78.0 1.0	\$11,146.00 \$180.00	\$11,146.00 \$180.00
	ii. Deliverables as outline in CMSM iii. Memo summarizing methodology & results		1	1		12	16		1	13.0 27.0	\$2,100.00 \$3,766.00	\$2,100.00 \$3,766.00
	iv. Field data, phots & desktop calculations v. GIS information turned into City				-	4	4	12		20.0 8.0	\$2,500.00 \$1,120.00	\$2,500.00 \$1,120.00
Task 6: Identify	VII. Kespond to one (1) round of PgM comments Concern Areas	A-7		1		8		<u>a-</u>		9.0	\$1,480.00	\$1,480.00
1. Identify	Loncern Areas and the Need for Hood Kisk Keduction i. Identify and Document Concern Areas ii. Donulate Ishee	0.0	<i>U.O</i>	0.0	<i>U.O</i>	0.0	0.0	0.0	0.0	0.0	\$0.00	\$0.00 \$0.00
2. Qualitati	we Analysis i Comelete Dualitative Analysis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.00 \$0.00	\$0.00
3. Scoring,	Categorizing, Identifying need for solution i. Concern Areas will be scored, weighted and categorized	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 \$0.00	\$0.00 \$0.00 \$0.00
4. QA Mee	ing i. QA Meeting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 \$0.00	\$0.00 \$0.00
5. Delivera	ii. Quality Checklist to PgM bles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 0.0	\$0.00 \$0.00	\$0.00 \$0.00
	i. Quality Checklist ii. Report section, GIS information, tables & exhibits									0.0	\$0.00	\$0.00
	IIII. Concern Area WorkBook In Excel Tormat iv. Submit draft of report to CMT for review v Inconcerta CMT comments in the final report									0.0	\$0.00	\$0.00 \$0.00
	Total	0.0	4.0	9.0	0.0	74.0	152.0	92.0	3.0	334	44248	\$44.248.00

## EXHIBIT C

# **GENERAL SERVICES AGREEMENT**

## GENERAL SERVICES AGREEMENT FOR CONSULTING SERVICES BETWEEN

#### CITY OF FAYETTEVILLE FAYETTEVILLE, NORTH CAROLINA

AND

.

**GRADIENT, PLLC** 

APRIL 1, 2022

#### STATE OF NORTH CAROLINA COUNTY OF CUMBERLAND

#### GENERAL SERVICES AGREEMENT FOR CONSULTING SERVICES

THIS AGREEMENT, effective the day of April 1, 2022 by and between THE CITY OF FAYETTEVILLE, NORTH CAROLINA (hereinafter referred to as CITY), with principal business offices at Fayetteville, North Carolina, and GRADIENT, PLLC (hereinafter referred to as CONSULTANT), a corporation with principal business offices at 230 Donaldson Street, Suite 500A, Fayetteville, NC 28301.

#### WITNESSETH:

WHEREAS, CITY, is engaged in the operation and maintenance of facilities and services which from time to time require revision, renovation and extension of existing facilities, and the construction of new facilities and other related projects; and

WHEREAS, the professional services of engineers, architects, surveyors and others will from time to time in the future be needed by the CITY in the renovation of existing facilities, and in the construction of new facilities and other related projects; and

WHEREAS, pursuant to N.C.G.S. 143-64.31 it is the public policy of this State that municipalities announce all requirements for architectural, engineering and surveying services, to select firms qualified on the basis of demonstrated competence and qualification and to negotiate contracts for services at a fair and reasonable fee with the best qualified firm; and

WHEREAS, CONSULTANT provides professional consulting services of the nature required by the CITY and employs trained and experienced engineering, technical and/or other personnel possessing adequate knowledge, skills and experience to provide professional services to the CITY; and

WHEREAS, the CITY proposes to announce to various competing firms its need for professional consulting services in the future by requesting Proposals and the subsequent acceptance of proposals and the issuance of written authorizations to proceed, which together with this Agreement shall constitute a contract between the CITY and the CONSULTANT; and

WHEREAS, the parties contemplate that the services of CONSULTANT will be performed in various stages in accordance with separate authorizations to be issued by CITY, and the parties desire to set forth the basic terms of their agreement in this General Services Agreement rather than in separate authorizations to be issued by CITY.

**NOW THEREFORE, IN CONSIDERATION** of the premises and the mutual covenants herein contained, the parties hereto do hereby contract and agree as follows:

**ARTICLE 1 - REQUEST FOR PROPOSAL-SUBMITTAL OF PROPOSAL.** As the need for consulting services arise, **CITY** will request a Proposal for said services from **CONSULTANT** which shall describe the scope of work, program, estimated schedule and **CITY'S** requirements.

If CONSULTANT has the qualified personnel to meet CITY'S requirements to perform the consulting services requested by the CITY, CONSULTANT will submit to CITY within the time specified a written Proposal describing the necessary engineering, technical and/or other services, guidance, opinions and advice to be provided. The Proposal shall set forth in general terms CONSULTANT'S recommendations to carry out the work. CONSULTANT shall list the background and experience of CONSULTANT'S personnel to be assigned to the project. Said Proposal shall contain a fee schedule setting forth fees for services of the various categories of personnel to be assigned to CITY'S project.

ARTICLE 1.1 - ACCEPTANCE OF PROPOSAL. CITY and CONSULTANT contemplate certain discussions, negotiations and possible changes to the Proposal submitted by CONSULTANT. Upon a meeting of the minds, CONSULTANT shall submit the final Proposal which shall set forth the agreement of the parties. If said Proposal is acceptable, the CITY shall accept same in writing. CONSULTANT'S fee schedule shall remain in effect during the term of this Agreement, unless modified by the parties in writing. CITY shall provide CONSULTANT with a specific written Authorization to Proceed for each Proposal accepted by CITY.

**ARTICLE 2 - TERM OF AGREEMENT**. The term of this General Services Agreement for Consulting Services shall be for three (3) years from the date it is effective. The Agreement may be extended thereafter by mutual written agreement of the parties.

ARTICLE 2.1 - ASSIGNMENT. It is the intent of this Agreement to secure the personal services of the CONSULTANT and failure of the CONSULTANT for any reason to make the personal services available to the CITY for the purposes described in this Agreement shall be cause for termination of this Agreement. The CONSULTANT shall not assign, sublet, or transfer any rights under or interest in (including, but without limitation, monies that may become due or monies that are due) this Agreement without the written consent of CITY. Nothing contained in this paragraph shall prevent CONSULTANT from employing such independent consultants, associates, and sub-contractors as it may deem appropriate to assist CONSULTANT in the performance of services rendered.

**ARTICLE 3 - COMPENSATION. CONSULTANT** shall submit to **CITY** monthly invoices for services performed during that month, computed on the basis of the Proposal accepted by **CITY**. **CITY** agrees to pay **CONSULTANT'S** monthly invoice within thirty (30) days after said invoice is received by the **CITY**. Adjustments to an invoice for billing errors may extend the time for payment. For clarity, compensation to **CONSULTANT** shall be based upon Task and/or Work Authorizations that are provided to and agreed upon by the **CITY**. The Signing of this General Services Agreement does not bind or obligate the **CITY** to pay **CONSULTANT** any compensation.

**ARTICLE 3.1 - VERIFICATION OF INVOICES. CITY** has the right to require the **CONSULTANT** to produce for inspection all **CONSULTANT**'S time records, salaries of personnel and charges for direct expenses for which cost-plus compensation is provided. **CONSULTANT** agrees to provide **CITY** with said records on a timely basis and cooperate with **CITY** to verify the accuracy of all invoices.

ARTICLE 3.2 - COSTS AND EXPENSES. CONSULTANT will invoice CITY for all travel and living expenses of its employees assigned to a project which said expenses shall be at actual cost, unless said costs or expenses are specifically set forth and included in a fixed price contract. Accommodations for CONSULTANT'S employees shall be arranged by CONSULTANT. Living expenses for CONSULTANT'S employees shall be the usual and customary expenses for accommodations to which CONSULTANT'S employees are accustomed, and which are prevailing in Cumberland County, North Carolina.

**ARTICLE 3.3 – NON APPROPRIATION.** Notwithstanding any other provisions of this Agreement, the parties agree that payments due hereunder from the CITY are from appropriations

and monies from the City Council and any other governmental entities. In the event sufficient appropriations or monies are not made available to the CITY to pay the terms of this agreement for any fiscal year, this Agreement shall terminate immediately without further obligation of the CITY.

**ARTICLE 4 - PROFESSIONAL STANDARDS AND DUTIES OF CONSULTANT. CONSULTANT** shall be held to the same standard and shall exercise the same degree of care, skill and judgment in the performance of services for **CITY** as is ordinarily provided by a similar professional under the same or similar circumstances at the time in Cumberland County, North Carolina.

ARTICLE 4.1 - CONSULTANT NOT RESPONSIBLE FOR CONSTRUCTION MEANS OR SAFETY. A CONSULTANT for general construction projects shall not be responsible for any general contractor's or other project participant's failure to fulfill their contractual responsibilities to the CITY, nor shall CONSULTANT be responsible for construction means, methods, techniques, sequences, or procedures. Neither shall CONSULTANT be responsible for a project safety program or safety precautions unless CONSULTANT'S Proposal sets forth a safety program which is accepted by CITY and becomes a part of the agreement between the parties.

ARTICLE 4.2 - CONSULTANT AS CONSTRUCTION MANAGER. In the event the CITY contracts with the CONSULTANT to provide Construction Management Services, the CONSULTANT shall be responsible for determining that each construction contractor provides work to the quality level specified and in accordance with the plans and specifications. In no event shall CONSULTANT be responsible for any contractor's, subcontractor's, vendor's, or other project participant's failure to comply with federal, state or local laws, ordinances, regulations, rules, codes, orders, criteria, or standards unless it has contracted with the CITY to do so.

ARTICLE 5 - ESTIMATES OF COST AND TIME. Although CONSULTANT has no control over the cost of labor, materials, equipment or services furnished by others, or over competitive bidding or market conditions, nevertheless CONSULTANT'S cost estimates and time estimates shall be made on the basis of current labor and material prices and the CONSULTANT'S experience and qualifications, and CONSULTANT'S estimates shall represent its best judgment as an experienced and qualified professional familiar with electric, water and sewer utility projects, or other projects for which CONSULTANT is employed. Although CONSULTANT has no control over the resources provided by contractors to meet contract schedules, nevertheless CONSULTANT'S estimates or forecast of schedules shall be made on the basis of its experience and qualifications and shall represent CONSULTANT'S best judgment as an experience and qualifications and shall represent CONSULTANT'S best judgment as an experience and qualified professional familiar with electric, water and sewer utility projects for which CONSULTANT'S best judgment as an experience and qualified professional familiar to sever utility projects, or other projects for which CONSULTANT for severe the basis of its experience and qualified professional familiar with electric, water and sever utility projects, or other projects for which CONSULTANT'S best judgment as an experience and qualified professional familiar with electric, water and sever utility projects, or other projects for which CONSULTANT is employed. CONSULTANT'S best judgment as an experience and schedules will not vary from the estimates and schedules given to CITY.

#### **ARTICLE 6.0 - LIABILITY, INDEMNIFICATION AND INSURANCE.**

6.1 - GENERAL. The CITY and CONSULTANT have considered the risks and potential liability that may exist during the performance of services by CONSULTANT, and have agreed to allocate such liabilities in accordance with this Article. During the performance of services under this Agreement, CONSULTANT shall purchase and maintain insurance coverage as hereinafter set forth, without lapse or changes contrary to the requirements of this section. Words and phrases used in this Article shall be interpreted in accordance with customary insurance industry usage and practice.

6.2 - INDEMNITY AND PROFESSIONAL LIABILITY. To the extent permitted by law, CONSULTANT agrees to defend, indemnify and hold harmless the CITY and its elected officials, employees, agents, successors, and assigns, from any and all liability and claims for any injury or damage caused by any negligent or tortious act, omission or negligence of CONSULTANT, its agents, servants, employees, contractors, licensees, or invitees. Indemnification of the **CITY** by **CONSULTANT** does not constitute a waiver of the **CITY'S** governmental immunity in any respects under North Carolina law. **CONSULTANT** agrees to purchase and maintain professional liability insurance (errors and omissions insurance) in the amount of \$1,000,000 coverage for each claim, with a general aggregate of \$2,000,000. Said insurance coverage shall be underwritten by an insurance company authorized to do business in the State of North Carolina by the North Carolina Department of Insurance, with an A.M. Best rating of not less than A-VII.

**6.3- LIABILITY INSURANCE. CONSULTANT** agrees to indemnify and hold the **CITY**, its servants, agents and employees, harmless from and against all liabilities, claims, demands, suits, losses, damages, costs and expenses (including attorney's fees) for third party bodily injury to or death of any person, or damage to or destruction of any third party property, to the extent caused by the negligence of the **CONSULTANT**, Consultant's employees, and Consultant's subcontractors, for whom **CONSULTANT** is legally responsible during the performance of services under this Agreement. **CONSULTANT** shall purchase and maintain at all times during performance of services under this Agreement Commercial General Liability Insurance with combined single limits of \$1,000,000.00 coverage for each occurrence with a general aggregate of \$2,000,000.00, designating the **CITY** as an additional insured and which said insurance provides **CONSULTANT** with insurance for contractual liability which CONSULTANT has assumed pursuant to the terms of this Article 6.

**6.4- OTHER INSURANCE.** In addition to professional liability insurance and commercial general liability insurance set forth above, **CONSULTANT** further agrees to purchase and maintain at all times during the performance of services under this Agreement insurance coverage as follows:

- (a) Worker's Compensation Insurance as provided by North Carolina law which said policy shall also afford coverage to **CONSULTANT** for employer's liability.
- (b) Automobile liability insurance with \$1,000,000.00 combined single limit for each accident covering bodily injury and property damage.
- (c) The CGL policy required above shall include independent contractor liability coverage.
- (d) The CGL policy required above shall provide CONSULTANT with products and completed operations insurance, said coverage to be written on an occurrence basis, with coverage extended for such a period of time that suits can be filed before the running of the statute of limitations on any claim for injury to person or property due to negligence of CONSULTANT in the design of any building designed by the CONSULTANT under the terms of this Agreement.

ARTICLE 7 - INDEPENDENT CONTRACTOR. CONSULTANT is an independent contractor and shall undertake performance of the services pursuant to the terms of this Agreement as an independent contractor. CONSULTANT shall be wholly responsible for the methods, means and techniques of performance. CITY shall have no right to supervise methods and techniques of performance employed by CONSULTANT, but CITY shall have the right to observe such performance.

ARTICLE 8 - COMPLIANCE WITH LAWS. CONSULTANT agrees that in performing services pursuant to this Agreement to comply with all applicable regulatory requirements including federal, state and local laws, rules, regulations, orders, codes, criteria, and standards. CONSULTANT shall be responsible for procuring all permits, certificates, and licenses necessary to allow CONSULTANT to perform services under this Agreement. CONSULTANT shall not be responsible for procuring permits required for the construction of any building, unless such responsibility is specifically agreed to by CONSULTANT.

ARTICLE 9 - CITY'S RESPONSIBILITIES. CITY will furnish to CONSULTANT all of CITY'S requirements for the project, including, but not limited to, scope of work, program, time constraints, schedule milestones, financial constraints, design objectives and design constraints, which are available to the CITY or which the CITY can reasonably obtain to furnish to CONSULTANT to enable CONSULTANT to make a Proposal to CITY. Additionally, the CITY shall also be responsible for the following:

- (1) Make final decisions utilizing information supplied by CONSULTANT.
- (2) Designate personnel to represent CITY in matters involving the relationship between CITY, CONSULTANT and third parties.
- (3) Provide such accounting, independent cost estimating, and insurance counseling services as may be required by the project.
- (4) Provide such legal services as **CITY** may require or **CONSULTANT** may reasonably request with regard to legal issues pertaining to the project, including those which may be raised by contractors, subcontractors, vendors or other project participants.
- (5) Enter into contracts for the purchase, construction, or other services with contractors, subcontractors, and vendors.
- (6) Provide financing for the project and make all payments in accordance with the terms of the contract.

ARTICLE 10 - OWNERSHIP OF DOCUMENTS. All documents, including drawings and specifications prepared by CONSULTANT pursuant to this AGREEMENT, are instruments of service in respect of the Project. They are not intended or represented to be suitable for reuse by CITY or others on extensions of the Project or on any other project. Any reuse without written verification or adaption by CONSULTANT for the specific purpose intended will be at CITY'S sole risk and without liability to CONSULTANT. Any such verification or adaptation will entitle CONSULTANT to further compensation at rates to be agreed upon by CITY and CONSULTANT.

**ARTICLE 11 - TERMINATION OF CONTRACT FOR CAUSE**, In the event of substantial failure by **CONSULTANT** to perform in accordance with the terms of this contract, **CITY** shall have the right to terminate **CONSULTANAT** upon ten calendar (10) days written notice in which event **CONSULTANT** shall have neither the obligation nor the right to perform further services under this contract nor shall the **CITY** be obligated to make any further payment for work that has not been performed.

**ARTICLE 12 - TERMINATION OF CONTRACT FOR CONVENIENCE.** Upon thirty (30) calendar days' written notice to **CONSULTANT**, **CITY** may, without cause and without prejudice to any other right or remedy legally available to the **CITY**, terminate this Contract. Upon such notice, **CONSULTANT** shall have neither the obligation nor the right to perform services under this contract nor shall the **CITY** be obligated to make any further payment for work that has not been performed in accordance with the terms stated herein. In such case of termination, **CONSULTANT** shall be paid for the completed and accepted work executed in accordance with this Contract prior to the written notice of termination. Additionally, upon mutual agreement, **CONSULTANT** may be paid for any completed and accepted work which takes place in order to achieve a specifically identified item in the scope of services or a milestone of the Contract, between the written notice of termination and the effective date of termination. Unless otherwise stated or agreed upon, the effective date of termination shall automatically occur 30 days after the written notice is sent by the **CITY**.

**ARTICLE 13 - NONDISCLOSURE OF PROPRIETARY INFORMATION. CONSULTANT** shall consider all information provided by **CITY** and all drawings, reports, studies, calculations, plans, specifications, and other documents resulting from the **CONSULTANT'S** performance of the **SERVICES** to be proprietary, unless such information is available from public sources. **CONSULTANT** shall not publish or disclose proprietary information for any purposes other than the performance of the **SERVICES** without the prior written authorization of **CITY**. **CONSULTANT** shall not make any written or verbal statement to any press or news media concerning the Project without the written authorization of **CITY**.

**ARTICLE 14 - NOTICE.** Any formal notice, demand, or request required by or made in connection with this agreement shall be deemed properly made if delivered in writing or deposited in the United States mail, postage prepaid, to the address specified below.

TO CITY:	CITY OF FAYETTEVILLE
	ATTENTION: DOUGLAS J. HEWETT
	CITY MANAGER
	433 HAY STREET
	FAYETTEVILLE, NORTH CAROLINA 28301
TO CONSULTANT:	GRADIENT, PLLC
	ATTENTION: GORDON A. ROSE, PE
	MEMBER/MANAGER

Nothing contained in this Article shall be construed to restrict the transmission of routine communication between representatives of **CONSULTANT** and **CITY**.

FAYETTEVILLE, NC 28301

**ARTICLE 15 – FORCE MAJEURE.** Neither party shall be deemed to be in default of its obligations hereunder if and *so long as* it is prevented from performing such obligations by an act of war, hostile foreign actions, adverse governmental actions, nuclear explosion, earthquake, hurricane, tornado, or other catastrophic natural event or act of God.

230 DONALDSON STREET, SUITE 500A

**ARTICLE 16 - GOVERNING LAW.** This Agreement shall be governed by the laws of the State of North Carolina.

#### **ARTICLE 17 - MISCELLANEOUS.**

17.1 NONWAIVER FOR BREACH. No breach or non-performance of any term of this Agreement shall be deemed to be waived by either party unless said breach or non- performance is waived in writing and signed by the parties. No waiver of any breach or non- performance under this Agreement shall be deemed to constitute a waiver of any subsequent breach or non-performance and for any such breach or non-performance each party shall be relegated to such remedies as provided by law.

**17.2 PRECEDENCE.** In the event of any conflict or discrepancy between the terms of this Agreement and the specific written authorization to proceed pursuant to this Agreement, then the written authorization to proceed shall be given precedence over this Agreement in resolving such conflicts or discrepancies. If any conflict or discrepancy is discovered by either party hereto, then the written authorization to proceed, or this Agreement, shall be modified or amended, as necessary.

**17.3 SEVERABILITY.** The invalidity, illegality, or un-enforceability of any portion or provision of this Agreement shall in no way affect the validity, legality and/or enforceability of any other portion or provision of this Agreement. Any invalid, illegal or unenforceable provision of

this Agreement shall be deemed severed from this Agreement, and the balance of the Agreement shall be construed and enforced the same as if the Agreement had not contained any portion or provision which was invalid, illegal or unenforceable. Provided, however, this section 17.3 shall not prevent this entire Agreement from being void in the event any portion or provision of this Agreement which is of the essence of this Agreement shall be deemed void as provided by law or as determined by a court of competent jurisdiction.

**ARTICLE 18 - INTEGRATED AGREEMENT.** The **CITY'S** request for Proposal, the **CONSULTANT'S** written Proposal, the **CITY'S** authorization to proceed and this General Services Agreement for Consulting Services shall be integrated into and shall become the integrated agreement between the parties. **CONSULTANT** and **CITY** agree that all prior negotiations, representations, proposals, letters, agreements, understandings, or other communications between them, whether written or oral, are hereby merged into the Agreement and that the Agreement supersedes all such prior negotiations, contracts and/or agreements. This Agreement shall not be modified unless such modifications are evidenced in writing, signed by both **CONSULTANT** and **CITY**.

**ARTICLE 19 - BENEFITS LIMITED TO PARTIES.** Nothing herein shall be construed to give any right or benefits hereunder to anyone other than **CITY** and **CONSULTANT**.

**19.1** LIMITATIONS. CONSULTANT's total liability to CITY under each authorization shall not exceed the total compensation paid under the authorization, or \$1,000,000, whichever is greater; any portion of liability determined to be consequential damages under this per authorization limit, shall not exceed the compensation paid under the authorization. In no event shall **CONSULTANT's** total liability in the aggregate, for all services under this agreement, exceed \$4,000,000. limits set forth in this agreement shall apply notwithstanding any and all causes whatsoever including, but not limited to negligence (of any degree), errors, omissions, warranty, indemnity, strict liability or breach of contract, provided, however, that the foregoing limitation shall not apply to any indemnity obligations of consultant with respect to third party personal injury and death or damage to third party property.

**ARTICLE 20 – VENUE AND FORUM SELECTION.** The Parties expressly agree that if litigation is brought in connection with this contract and (1) the litigation proceeds in the Courts of the State of North Carolina, the parties agree that the appropriate venue shall be in Cumberland County (Twelfth Judicial District of North Carolina); or (2) the litigation proceeds in a federal court, the parties agree that the appropriate venue shall be the United States District Court for the Eastern District of North Carolina.

ARTICLE 21 - E-VERIFY. CONSULTANT acknowledges that "E-Verify" is the federal E-Verify program operated by the US Department of Homeland Security and other federal agencies which is used to verify the work authorization of newly hired employees pursuant to federal law and in accordance with Article 2, Chapter 64 of the North Carolina General Statutes. CONSULTANT further acknowledges that all employers, as defined by Article 2, Chapter 64 of the North Carolina General Statutes, must use E-Verify and after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with NCGS §64-26(a). CONSULTANT pledges, attests and warrants through execution of this contract that CONSULTANT complies with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes and further pledges, attests and warrants that any subcontractors currently employed by or subsequently hired by CONSULTANT shall comply with any and all E-Verify requirements. Failure to comply with the above requirements shall be considered a breach of this contract.

ARTICLE 22 – MORALITY CLAUSE. If, in the sole opinion of the CITY, at any time CONSULTANT or any of its owner(s) or employee(s) or agent(s) (collectively referenced as an "Actor") engages in any one or more actions that bring disrepute, contempt, scandal, or public ridicule to the Actor or subject the Actor to prosecution or offend the community or public morals or decency or denigrate individuals or groups in the community served by the CITY or are scandalous or inconsistent with community standards or good citizenship or may adversely affect the CITY'S finances, public standing, image, or reputation or are embarrassing or offensive to the CITY or may reflect unfavorably on the CITY or are derogatory or offensive to one or more employee(s) or customer(s) of the CITY, the CITY may immediately upon written notice to CONSULTANT terminate this Contract, in addition to any other rights and remedies that the CITY may have hereunder or at law or in equity.

**ARTICLE 23** – **PROTEST.** Protest related to this procurement must be addressed to the Purchasing Manager for City of Fayetteville, 433 Hay St, Fayetteville, NC 28301 and shall be received, in writing, within 2 calendar days of bid award. Responses will be in writing by email and first-class mail not later than (7) calendar days following receipt of said protest by the Purchasing Manager.

ARTICLE 24 - IRAN DIVESTMENT ACT CERTIFICATION. As mandated by N.C.G.S. 147-86.59(a), CONSULTANT hereby certifies that it is not listed on the Final Divestment List created by the North Carolina State Treasurer pursuant to N.C.G.S. 147-86.58. CONSULTANT further certifies that in accordance with N.C.G.S. 147-86.59(b) that it shall not utilize any subcontractor found on the State Treasurer's Final Divestment List. CONSULTANT certifies that the signatory to this General Services Agreement is authorized by the CONSULTANT to make the foregoing statement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their duly authorized representatives effective the day and year first above written.

		CITY OF FAYETTEVILLE
	CITY OF FAYETTEVILLE, NORTH CAROLINA	This instrument has been pre-audited in the man Required by the Local Government Budget and Fis Control Act.
date: 4/22/2022	BY: Amplas () Hewett	
ATTEOT	Douglas J. Hewett, ICMA-CM	Chief Financiał Officer
AllESI.	City Manager	
Tanela J. Hegelf		
CITY CLERK		
Kin	1762 JEFENT. PLLC	
, /		
DATE: 3/31/22	BY: Jum An	
	Gordon A. Rose, PE	
	TITLE: Member/Manager	

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