CITY OF HIGH POINT
AGENDA ITEM

TITLE: **Water Supply Protection– Professional Engineering Services Tetra Tech**	
FROM: Robby Stone – Public Services Director Derrick Boone – Asst. Public Services Director	**MEETING DATE:** June 3, 2024
PUBLIC HEARING: N/A	**ADVERTISED DATE/BY:** Master Agreement - Task Order
ATTACHMENTS: Scope of Services	

PURPOSE: To approve a Task Order with Tetra Tech for the Professional Engineering Services to perform Phase 3 of the IWAF (Integrated Watershed Assessment Framework Implementation) for Water Supply Protection. The city has a Master Agreement for Professional Services with Tetra Tech.

BACKGROUND: The City of High Point is responsible to its citizens and businesses for managing water quantity and quality while maintaining compliance with state and federal regulations. This involves managing stormwater runoff, treating wastewater, protecting water quality, providing water supply for drinking water and a recreational destination for people interested in boating, fishing, golfing, camping, and other outdoor activities.

Phase 1 was started in July 2020 and the city team established goals of assessment across the departments, specified objectives under each goal, identified water quantity and water quality indicators related to each objective.

Phase 2 of the project was started in April 2021 and included the construction of watershed models for Arnold Koonce City Lake and Oak Hollow Reservoir that are linked to the watershed model to support watershed and water supply protection management planning in the city. Phase 2 also included a Future Condition Analysis Integrated Watershed Assessment Framework (IWAF) Model Application that allows City staff to predict potential future impacts under current management programs and policies, and guide decisions for modifying those programs as needed.

Phase 3 will involve application and maintenance of the IWAF. Experts will apply the watershed, lake, stormwater, and flood assessment models as directed to support City planning and operations. Tetra Tech will work closely with the City team to outline applications to support their CIP planning and implementation operations.

BUDGET IMPACT: Funds for this project are available in the FY 2023-2024 budget.

RECOMMENDATION/ACTION REQUESTED: The Public Services Department recommends approval and asks for the Council to award a Task Order for Professional Engineering Services to Tetra Tech in the amount of $150,000 and authorize appropriate city staff to execute all necessary documents.

Phase 3, Integrated Watershed Assessment Framework (IWAF) Project – Scope of Work for IWAF Implementation for Water Supply Protection

April 26, 2024

TO BE PERFORMED FOR

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BY

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EXECUTIVE SUMMARY

This Scope of Work supports implementation of the recently completed Integrated Watershed Assessment Framework (IWAF) co-designed by a team of City staff and Tetra Tech to meet multiple program needs for water-related project planning and program compliance. The IWAF design (Phase 1 of the project) was completed in March 2021 with completion of the IWAF Goals document and IWAF Model Development Plan. IWAF Phase 2 model development was initiated in April 2021 and was completed in March 2024. Under Phase 2, Tetra Tech developed Hydrological Simulation Program Fortran (HSPF) watershed models for the entire City Planning Area and watersheds draining to it. The team then completed development of CE-QUAL-W2 lake models for City Lake and Oak Hollow Lake, integrating them with the HSPF watershed models. As the final step under Phase 2, Tetra Tech set up a pilot stormwater and flood modeling system for the Richland Creek watershed using the PCSWMM model for stormwater impact analysis and the Hydrologic Engineering Center River Analysis Package (HEC-RAS) for flood risk assessment.

In addition to model development, IWAF Phase 2 work included an initial Baseline Analysis intended to be a starting point for future water-related planning by City programs. For the analysis, Tetra Tech developed a future land use/cover and climate scenario for the years 2040 to 2060 for the IWAF linked watershed-lake modeling system. The results from modeling this future condition scenario were compared with historical modeling results for the years 2000 through 2020 (referred to as hindcast conditions) using the same global climate model scenario to provide an indication of the potential relative change in hydrology and water quality throughout the City planning area's watersheds and two primary water supply lakes, Oak Hollow Lake and City Lake. The comparison provides preliminary information for the City to consider regarding potential impacts of future land use and climate change in its water-related management planning and program decision-making. As such, the results represent a starting point or baseline to enable City staff to begin planning how to prepare for or adapt to potential future impacts and guide decisions for modifying their programs as needed for elements including water supply protection, stormwater and flood management, comprehensive planning and ordinances for new development or redevelopment, and parks restoration project planning as outlined in the goals established during Phase 1 of the project.

This Scope of Work begins Phase 3 as originally outlined for the IWAF. Phase 3 will involve application and maintenance of the IWAF building on the investment already made by the City of High Point. Experts will apply the watershed, lake, stormwater and flood assessment models as directed to support City planning and operations. Tetra Tech will work closely with the City team of program managers to outline applications to support their CIP planning and implementation operations.

The cost for this initial phase IWAF implementation is $150,000 with anticipated completion between 12 and 18 months depending on City needs.

1.0 SCOPE OF WORK

The purpose of this Scope of Work (SOW) is to support the City team in implementing the recently developed Integrated Watershed Assessment Framework (IWAF). Specific applications will be developed in consultation with City team members under the direction of the Public Services Department. Initially, efforts are anticipated to support the City's Comprehensive Plan development process, parks facility protection, stormwater and flood management, and water supply watershed protection planning. These applications are outlined generally below but are subject to refinement with the City team to provide the best value to the City.

1.1 WATER SUPPLY WATERSHED PROTECTION PLANNING

The City maintains a Water Supply Source Water Protection Plan for its primary and backup water supplies. Previous water supply protection planning work has focused on areas in close proximity to the City's primary water supply lakes, Oak Hollow Lake and City Lake (2017 Draft Watershed Plan Update, Tetra Tech). Completion of the IWAF linked watershed and lakes modeling system provides the City with the ability to consider the impacts from all sources within each lake's respective watershed drainage area. The recently completely Baseline Analysis indicates that the lakes may experience additional water quality degradation in the future if additional management measures are not put in place to mitigate those impacts.

The Baseline Analysis modeling predicts total flow increases to the High Point water supply lakes to increase between approximately 20 percent and 60 percent for extreme storm events that occur less than or equal to 5 percent of the time. Consequently, the quality of both streamflow and lake water was predicted to decrease due to larger sediment and nutrient loads originated from changed land use for projected future conditions, such as additional lawns, parking lots, and other impervious surfaces. Increased nutrient loads, coupled with warmer air and water temperatures, are predicted to accelerate biochemical processes like algae growth in the lakes. This could lead to a degradation of the water quality conditions in the lakes if mitigation measures are not implemented in a timely manner. Similarly, higher concentration of suspended particles, such as TSS and TN, could cause changes in the color and odor of lake water and result in elevated water treatment costs without further preventive management action. This degradation can affect the City's capacity to provide clean and safe water reliably to its residents and businesses cost-effectively.

Although the Baseline Analysis results are not 100 percent certain, they are meant to provide a baseline level of understanding for the City of High Point to consider in its management decision-making. Where potential threats to community well-being are indicated, the City may want to modify its program operations, consider changes to its local ordinances and policies, and invest in capital improvement projects that will help to mitigate negative impacts. The latter includes accounting for future conditions in infrastructure designs that the City is now considering or will consider in the near future to make sure that they are resilient to projected future extreme events. These and other considerations can now be better addressed in an updated water supply watershed protection plan.

Under this task, Tetra Tech will work with Public Services staff and other City program staff as needed to determine next steps in evaluating watershed protection options for consideration in its City ordinances, Comprehensive Plan, and various program operations. The IWAF modeling system can be used as appropriate to simulate hydrologic and water quality response to proposed alternatives to inform future plan and CIP decision-making. Results will be provided in graphic and written form for reference by the City. In some cases, the City may want to conduct further analyses focused on specific issues to further define a preferred path forward. The IWAF can support additional planning and complement other planning and design methods used by the City.

1.1.1 HP2045 Comprehensive Plan analysis

The objective of this task is to assist the City Planning Department and Public Services in evaluating the impact of City Planning and Zoning Commission's recommended HP2045 Comprehensive Plan on the hydrology and water quality of the City's watersheds and lakes. Tetra Tech will work with the City and its planning consultant to develop a modeling scenario to represent the Comprehensive Plan features and run the linked watershed and lakes modeling component of the IWAF. Results will be compared to the baseline analysis results to see the extent that the Plan currently helps mitigate projected hydrology and water quality impacts or potentially requires additional management support to protect the City's water supplies.

Deliverables

Modeling results will be provided in both graphic (PowerPoint) and written form (technical memorandum) for reference by the City.

1.1.2 Water Supply Protection Options Development and Evaluation

Based on the results of the subtask 1.1.1 analysis, Tetra Tech will work with the City Team to identify measures to protect the City's water supplies. We anticipate this to include measures that the City can take on it's properties within the water supply watersheds (including revisiting the recommendations drafted in 2017) and broader measures that may be beneficial throughout the watershed or in identified zones of interest. The modeling results will first be used to identify primary sources of concern and their locations. Tetra Tech will then work with the City Team (and other stakeholders as the City directs) in a workshop setting to identify potential management measures for preliminary consideration.

Tetra Tech will use the IWAF models and supplemental tools to predict the relative effectiveness of measures in protecting the water supply while also considering their economic, social, and overall environmental implications. Results will be documented to inform the City Team who will then be asked to prioritize management measures to include in an updated watershed management plan. Team members will be asked to help establish the criteria for prioritizing, and then to rate the measures for relative importance according to those criteria.

Deliverables

a) Workshop materials identifying primary sources of concern and their location regarding threats to water supply protection, and summarizing relative protection from existing management measures
b) Facilitated workshop to identify potential management measures
c) Technical memorandum and PowerPoint presentation summarizing the relative effectiveness of the various management options
d) Facilitated City Team meeting to establish and apply criteria for prioritizing management measures to include in an updated Water Supply Watershed Protection Plan

1.1.3 Water Supply Watershed Protection Plan Update

Using the results of subtask 1.1.2 management evaluation and prioritization, Tetra Tech will prepare an updated Water Supply Watershed Protection Plan for the City of High Point. Materials from the draft phase 1 update will be reviewed for relevance and incorporated as endorsed by the City Team. That information will be expanded upon to address the full watershed-scale incorporating the prioritized items. A draft version will be prepared for the City Team, reviewed together, and refined for submittal to the City Manager's office and potential consideration of the City Board. It is assumed that the City Council will want public input on the proposed update before considering endorsement of the plan. Tetra Tech will

support the City in presenting the plan to the Council and public, evaluating input received, and presenting a refined version to the Council for approval.

Deliverables

a) Proposed outline for Plan update for City Team review
b) City Team meeting to refine the Plan outline
c) Draft Water Supply Watershed Protection Plan for City Team review
d) City Team meeting to refine the draft Plan
e) Presentation (PowerPoint) for City Council and public draft Plan review
f) City Council and public meeting support
g) City Team meeting to refine draft Plan to address Council and public input
h) Final Water Supply Watershed Protection Plan for City Team review
i) Presentation (PowerPoint) for City Team and City Council on final Plan

1.2 PROJECT MANAGEMENT AND COORDINATION WITH THE CITY

Tetra Tech will coordinate with the City of High Point to manage this contract and plan work under its provisions. This includes corresponding with City staff, planning work, estimating level of effort, tracking accounting, preparing work summaries to accompany billing invoices which will be submitted no more than monthly.

Deliverables

a) Monthly invoices and progress reports
b) Periodic calls and emails regarding contract and project management on an as needed basis and as allowed for with project resources

2.0 PROPOSED BUDGET

The proposed budget for this SOW is $150,000. The amount represents a total not-to-exceed value without written approval from City contract manager. It is anticipated this will cover IWAF implementation assistance for approximately 12 – 18 months. Billing will be based on the following staff and rates as outlined in the master services contract for Tetra Tech with the City.

Time and Material rates for proposed staff (per Master Services Agreement)

Person	Role	Billing Category	Yr 2 ($/hr)
1. Trevor Clements	PM/Principal Planner	Principal Contract Manager	212
2. Holly Miller, PE	Principal in Charge	Executive Management	238
3. Jonathan Smith, PE	Senior Design Engineer	Senior SW Engineer	220
4. Hillary Yonce, PH	Senior Scientist	Senior Scientist	192
5. Stephanie MacDurmon,PE	Senior Stormwater Engineer	Senior SW Engineer	184
6. Afshin Shabani	CE-QUAL-W2 Modeling	Project Engineer	158
7. Bobby Tucker	PCSWMM Modeling	Project SW Engineer	156
8. Dylan Owen	Waters Resources Eng'g	Project WR Engineer	150
9. Jon Butcher	Sr Modeling QAQC	Consulting Engineer	146
10. Maddie Keefer	HSPF Modeling	Project Engineer	144
11. Le'An Parker	Contract Administration	Contract Administration	132
12. Ellie Kremer	Science & Engineering	Staff Engineer	121
13. Will Hicks	Engineering & Modeling	Staff Engineer	115
14. Christina Buxton	Editor/Technician	Editor/Technician	115

Other direct costs (local travel, equipment/supplies) will be billed at cost plus 15% fee

3.0 SCHEDULE

Work schedules for efforts under any of the SOW tasks will be established with the City team dependent on the priorities of the City, subject to approval of the Public Services Department overseeing this work.